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The publications of the Geological Survey shall consist of the annual report of operations, geological and economic maps illustrating the resources and classifications of the lands, and reports upon general and economic geology and paleontology. The annual report of operations of the Geological Survey shall accompany the annual report of the Secretary of the Interior. All special memoirs and reports of said Survey shall be issued in uniform quarto series if deemed necessary by the Director, but otherwise in ordinary octavos. Three thousand copies of each shall be published for scientific exchanges and for sale at the price of publication; and all literary and cartographic materials received in exchange shall be the property of the United States and form a part of the library of the organization: And the money resulting from the sale of such publications shall be covered into the Treasury of the United States.

ANNUAL REPORTS.

From the above it will be seen that only the Annual Reports, which form parts of the reports of the Secretary of the Interior and are printed as executive documents, are available for gratuitous distribution. A number of these are furnished the Survey for its exchange list, but the bulk of them are supplied directly, through the document rooms of Congress, to members of the Senate and House. Except, therefore, in those cases in which an extra number is supplied to this Office by special resolution, application must be made to members of Congress for the Annual Reports, as for all other executive documents.

Of these Annuals, there have been already published:

I. First Annual Report to the Hon. Carl Schurz, by Clarence King, 8°, Washington, 1880, 79 pp., 1 map.—A preliminary report describing plan of organization and publications.

II. Report of the Director of the United States Geological Survey for 1880–'81, by J. W. Powell, 8°, Washington, 1882, lv, 588 pp., 61 plates, 1 map.

CONTENTS.

Report of the Director, pp. i–lv, plates 1–7.
Administrative Reports by Heads of Divisions, pp. 1–46, plates 8 and 9.
The Physical Geology of the Grand Cañon District, by Capt. C. E. Dutton, pp. 47–166, plates 10–36.
Contribution to the History of Lake Bonneville, by G. K. Gilbert, pp. 167–200, plates 37–43.
Abstract of Report on the Geology and Mining Industry of Leadville, Colorado, by S. F. Emmons, pp. 201–290, plates 44 and 45.
A Summary of the Geology of the Comstock Lode and the Washoe District, by George F. Becker, pp. 291–330, plates 46 and 47.
Production of Precious Metals in the United States, by Clarence King, pp. 331–401, plates 48–53.
A New Method of Measuring Heights by means of the Barometer, by G. K. Gilbert, pp. 403–565, plates 54–61.
Index, pp. 567–588.

The Third Annual Report is now in press.

MONOGRAPHS.

The Monographs of the Survey are printed for the Survey alone, and can be distributed by it only through a fair exchange for books needed in its library, or through the sale of those copies over and above the number needed for such exchange. They are not for gratuitous distribution.

So far as already determined upon, the list of these monographs is as follows:

I. The Precious Metals, by Clarence King. In preparation.
II. Tertiary History of the Grand Cañon District, with atlas, by Capt. C. E. Dutton. Published.
III. Geology of the Comstock Lode and Washoe District, with atlas, by George F. Becker. Published.

IV. Comstock Mining and Miners, by Eliot Lord. Published.

V. Copper-bearing Rocks of Lake Superior and their continuation through Minnesota, by Prof. R. D. Irving. In press.

VI. Older Mesozoic Flora of Virginia, by Prof. William M. Fontaine. In press.

Geology and Mining Industry of Leadville, with atlas, by S. F. Emmons. In preparation.

Geology of the Eureka Mining District, Nevada, with atlas, by Arnold Hague. In preparation.

Coal of the United States, by Prof. R. Pumpelly. In preparation.

Iron of the United States, by Prof. R. Pumpelly. In preparation.

Lesser Metals and General Mining Resources, by Prof. R. Pumpelly. In preparation.

Lake Bonneville, by G. K. Gilbert. In preparation.

Dinocerata. A monograph on an extinct order of Ungulates, by Prof. O. C. Marsh. In press.

Sauropoda, by Prof. O. C. Marsh. In preparation.

Stegosauria, by Prof. O. C. Marsh. In preparation.

Of these monographs, numbers II, III, and IV are now published, viz:

II. Tertiary History of the Grand Cañon District, with atlas, by C. E. Dutton, Capt. U. S. A. 1882, 4°, 264 pp., 42 plates, and atlas of 26 double sheets folio. Price $10.12.

III. Geology of the Comstock Lode and Washoe District, with atlas, by George F. Becker. 1882, 4°, 422 pp., 7 plates, and atlas of 21 sheets folio. Price $11.00.

IV. Comstock Mining and Miners, by Eliot Lord. 1883, 4°, 451 pp., 3 plates. Price $1.50.

Numbers V and VI are in press and will appear in quick succession. The others, to which numbers are not assigned, are in preparation.

BULLETINS.

The Bulletins of the Survey will contain such papers relating to the general purpose of its work as do not come properly under the heads of Annual Reports, or Monographs.

Each of these Bulletins will contain but one paper and be complete in itself. They will, however, be numbered in a continuous series, and will in time be united into volumes of convenient size. To facilitate this each Bulletin will have two paginations, one proper to itself and another which belongs to it as part of the volume.

Of this series of Bulletins No. 1 is already published, viz:

1. On Hypersthene-Andesite and on Triclinic Pyroxene in Augitic Rocks, by Whitman Cross, with a Geological Sketch of Buffalo Peaks, Colorado, by S. F. Emmons. 1883, 8°, 40 pp. Price 10 cents.

Correspondence relating to the publications of the Survey, and all remittances, should be addressed to the

DIRECTOR OF THE UNITED STATES GEOLOGICAL SURVEY,
Washington, D. C.

WASHINGTON, D. C., *March*, 1, 1883.

DEPARTMENT OF THE INTERIOR

MONOGRAPHS

OF THE

UNITED STATES GEOLOGICAL SURVEY

VOLUME IV

WASHINGTON
GOVERNMENT PRINTING OFFICE
1883

UNITED STATES GEOLOGICAL SURVEY
CLARENCE KING DIRECTOR

COMSTOCK

MINING AND MINERS

By ELIOT LORD

WASHINGTON
GOVERNMENT PRINTING OFFICE
1883

DEPARTMENT OF THE INTERIOR,
UNITED STATES GEOLOGICAL SURVEY,
NEW YORK, *March* 1, 1882.

SIR: I have the honor to transmit for your approval the accompanying report upon Comstock Mining and Miners, prepared under the direction of the Hon. Clarence King, late Director of the Geological Survey, and recording the development of this notable district from the first discovery of the precious metals within its borders to the close of the year 1880.

Very respectfully,

ELIOT LORD.

Hon. J. W. POWELL,
Director United States Geological Survey,
Washington, D. C.

PREFACE.

The monograph which I was instructed to prepare upon Comstock Mining and Miners is not a memoir of merely local importance and interest, but the record of a struggle which has materially affected the mining interests of the world. It is the story of the birth of the silver-mining industry in this country, and it portrays as well the most vigorous growth of that industry. The simple narrative is, in truth, not less marvelous than an Arabian tale, recounting, as it does, how a handful of earth tossed away carelessly by a poor immigrant became the loadstone which drew a swarm of men to a desert avoided even by beasts, and how from this clue a thread of gold was traced to its hidden source, and treasures rivaling the fancied store of the young Aladdin were unveiled. Its scenes present the toil of placer miners in an isolated cañon, the search of prospectors for gold and silver, the discovery of a world-famous lode, the extraordinary migration called tersely the "rush to Washoe," the life of a turbulent mining camp, and its ultimate crystallization into a thriving city.

It is shown, furthermore, how a barren peak, encircled by deserts and mountain ranges, was made the seat of populous towns, well supplied with water, food, and fuel; and how, in the course of only twenty years, the deepest and most productive silver mines in the world were excavated in a gangue of crumbling rock, in spite of a constant influx of water and an unprecedented increase of heat. By the contest waged in this district against the forces of nature contributions of the first importance to mining science have been furnished; the foremost practical miners of America have been trained, and more than three hundred millions of silver and gold have been wrested from the earth. Through the contention of its rival locators our national mining legislation was mainly shaped, and the colossal lottery of mining-stock speculation grew out of the opportunities here first offered. In the organization of its mines as an autocratic guild, in the maintenance of an arbitrary standard of wages, and in the resultant effect on the industry of the district and the condition of the laboring class, the student of political economy must needs be interested, and those who seek lucrative investments in mining enterprises may care to learn how the chief silver mines of this country have been controlled and managed, and how the great prizes in mining are commonly allotted, if this noteworthy instance may indeed be accepted as typical. From this starting point the silver mines of the great inland Territories have been sought out and developed, and no subsequent discoveries can rival the influence of this Lode, though they may perchance excel its yield in richness and magnitude.

To present these varied themes clearly and fairly in a well-joined narrative has been the aim of the writer. No assertion or statement of fact has been made without the citation of authorities. If, in any case, more positive evidence is desirable, its lack may fairly be attributed to the death of witnesses and the absence or destruction of trustworthy records. Cumulative evidence has only been cited when its support was clearly requisite, but all material obtained has been filed for reference among the manuscript records of the United States Geological Survey. No minute examination has been here essayed of subjects which have been elaborately treated in the complementary reports already published and now in press. For strictly technical discussions of the geology, chemistry, physics, and mechanics of the Lode, reference should be made to the standard treatises of Richthofen, King, Church, and Hague, and to the reports of Professor George F. Becker and W. R. Eckart, C. E., forming the principal portion of the series of volumes treating of the Comstock Lode as the work was originally planned. It has been judged, however, that the investigation here attempted merits a place in the annals of mining in America, and is fittingly conducted under the direction of the United States Geological Survey.

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COMSTOCK MINING AND MINERS.

BY ELIOT LORD.

CHAPTER I.

THE DISCOVERY OF GOLD.

The cloud banks blown overland from the Pacific are thrown in masses against the bristling teeth of the Sierra Nevada. Repelled at every point, they break in rain, snow, and hail among the mountains. Winter storms tear their way sometimes through this unyielding barrier and bury the hill-tops beyond under eddying snow-drifts, but a covering is rarely cast over the deformity of the deserts below. Looking eastward from any bare crag above the tree-belt, the eye sees no end to these desolate wastes, and beyond the range of vision they stretch unbroken for hundreds of miles. A few shallow rivers, fed by the mountain snows, wander in narrow beds through the cañons and valleys, vanishing at length in alkaline sloughs, or pouring their wasted streams into brackish lakes; broken fringes of green mark their winding courses—the only relief to the sombre tints of the landscape.

Yet, viewed from this distance, the naked barrenness of the land is less obtrusive. The simple outlines of the weather-beaten ridges blend with the enveloping haze and clear-cut shadows fall on the rolling plains. A soft drapery of worn brown velvet, with glinting threads of warmer hue, seems to cover the hills, and tracks of clay gleam white, like frozen lakes, in the ashen-hued desert. Over all towers a sky dome of clearest blue, flushed with the splendor of noon or glittering coldly with stars.

Descend into the midst of the desert and look closely around. The soft brown slopes are changed to scarred and crumbling heaps of rocks, the shining lakes to beds of alkaline earth seamed with innumerable cracks, and the grey plains to wastes of sand dotted thickly with clumps of sage brush. Here and there at long intervals stalks of bunch-grass thrust their stiff blades out of the arid soil, covered often with clinging crystals of salt which sparkle like frost in the sunlight. Dusky lizards dart about among the blackened rocks of the isolated ridges, and lizards with yellow backs sprawl on the hot sand. A little flock of sparrows may hover about some mountain spring, a coyote sometimes ambles over the hills, and jack-rabbits scurry through the sage brush in ridiculous alarm, but the oppressive stillness is rarely broken by the movement of anything with life. Nature seems to sleep, except when the brooding air is stirred by the passage of clouds and columns of feathery dust borne by eddying whirlwinds over the desert. The sight recalls the words of Marco Polo, describing the deserts about Khubees, "where there is neither fruit nor trees, and the water is bitter and bad, so that a traveler must carry it and food for himself, but the beasts drink that on the road, though very unwillingly."[1] It was over this dreary land that the Mexican guide of Fremont pointed, from the mountain pass at the head of the river San Joaquin. "There," said he, "there are the great llanos. There is neither water nor grass—every animal which goes out upon them dies."

The most pitiless of tyrants might hesitate to exile his enemy to such an earthly hell, but the people who have been doomed to live in this desolate region make no complaint and wish for no better home. To endure their condition without a murmur might well be counted a mark of surpassing fortitude, but to love a country such as this appears a well-nigh incredible prejudice of patriotism; yet it is said that the tribes who have wandered for an unknown term of years on this American Sahara cling to their wretched homes with an instinctive devotion not less intense than the yearnings of the exiled Swiss for the green valleys of the Tyrol.[1]

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[1] Travels of Marco Polo.—(Trans. by Hugh Murray, F. R. S. E., p. 226.)

It does not lie within the scope of this narrative to speak in detail of the life of the Shoshones and Bannocks, of the Apaches and Navajos, included in the Shoshonian and Athabascan families, the chief stocks holding possession of the Great Basin from the Columbia to the Rio del Grande,[2] but their character and condition may be briefly outlined.

The published journals of the earlier explorers of the Great Basin are full of high-seasoned descriptions of the native inhabitants, which must be accepted with due allowances for the embellishments of fancy and for errors arising from a limited or unfavorable period of observation. The Apache, for instance, has been pictured as malignant, cruel, and treacherous in the extreme, but he is rarely credited with the few savage virtues which he actually possesses, while the Shoshonian tribes have been accounted the very dregs of humanity, so depraved indeed that, as Bancroft writes—"there is surely room for no missing link between them and the brutes."[3]

The truth is, that the Shoshones, as compared with the other Indian tribes of this country, fall somewhat below the average in vigor of mind and body, but they are by no means the lowest of the race,[4] and it is absurd to class them with the Veddas of Ceylon or some of the Australian tribes. Their mode of life had many features in common with the better class of tribes, but the dreary and barren nature of the region where they lived and the hostility of stronger tribes reduced them sometimes to the direst straits, when they were forced to devour lizards, grasshoppers, roots, and grass seeds, and even "in a fiercer agony of hunger to eat the dead bodies of their starved companions or to kill their children for food."[5] It is the picture of these unfortunate beings when under the stress of starvation which has been handed down as the representative one, and their normal condition has been rarely noted or described with accuracy. If their life had its dark side, it was by no means unrelieved, for seasons of scarcity were followed by seasons of plenty, when the animal improvidence which characterizes their social state led them to revel in the present, which contained for them no reminder of the bitterness of the past or of the sure privations of the future.

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[1] Bancroft's Native Races of the Pacific States, vol. I, p. 441.

[2] Major J. W. Powell.

[3] Bancroft's Native Races, vol. I, pp. 427–440.

[4] Major J. W. Powell.

[5] Bancroft's Native Races, vol. I, pp. 427–440.

Yet such is the nature of the region bordering upon the eastern slope of the Sierras, and such the character of its savage inhabitants, that forty years ago no territory in America seemed more unlikely to attract a swarm of colonists. Except along its northern boundary there was nothing to tempt the entrance of the intrepid fur trader, and even the undaunted Jesuit missionaries contented themselves with maintaining the white crosses of their stations on its border line. Thus the outside world knew and cared to know but little of this broad and seemingly worthless tract, and the homes of the Basin tribes would have been secure from intrusion to this day had it not been for the discovery of the treasures hoarded up in the barren ridges and cañons.

East of the main chain of the Sierra Nevada, between the parallels of 38° and 41°, lies a range of hills separated from the great Sierra by three narrow valleys. Low cross spurs near the centre of the range connect it with the mountain chain and form a continuous rim to the shallow basin of the central valley. A miniature lake, fringed with woods in early days, lies in the basin, which received the name of Wásh-o, from a distinctive tribe so called, whose fishing grounds were bounded on the north by a conventional line which crossed this valley. The territory north of this line, as far as the cluster of lakes on the parallel of 40°, was held by the Nyumas,[1] a tribe of the Shoshonian family, and their lodges were scattered along the line of a river which flowed down the northernmost of these valleys into the deep green waters of the lake named Pyramid by Fremont, who first caught sight of it, "set like a gem in the mountains," on the 10th of January, 1844.[2]

Near the mouth of the river, among groves of cottonwood, was the main village of the fortunate Nyumas,[3] who had secured possession of one of the few oases of the Great Basin. Here they lived, well fed and peacefully, except for an occasional wrangle with the neighboring Wash-o tribe, over whom they domineered as a weaker and alien people. In mental and physical traits, as well as in language, the distinction between these tribes was strongly marked. The bodies of the Wash-o were short and sturdy, with broad fat hips supported by bowed legs. Heavy cheeks, smeared with red earth, drooped like dewlaps below the sensual mouth and short flat nose. In the pear-shaped face were small deep-set black eyes, sometimes twinkling and merry, sometimes somnolent and bleared. Coarse black hair grew low down on the narrow forehead and fell about the neck and cheeks in a thick mop. The hands and feet were small and shapely, but the form otherwise was clumsy and ungainly. Scanty coverings of patched and dirty skins were wound about the copper-colored bodies, but the natural layers of fat were the main protection against the winter winds.

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[1] Or Kú-yu-wi-ti-kút-teh, sucker-eaters, (probably a species of carp,) a tribe of the Pai-ú-te nation. Stephen Powers, Special Agent Smithsonian Institution.

[2] Fremont's Expeditions, p. 216.

[3] Fremont's Expeditions, pp. 218, 219.

The Nyumas, on the other hand, were taller and lighter colored as a class than the Wash-o, their complexion having a peculiar ashen tint. The typical Nyumas of middle age had wide cheek bones and a lean, long face, with sunken cheeks and heavy superciliary ridges over the large black eyes, which stared about with keen, hungry looks, quite different from the tranquil and sensuous gaze of the Wash-o.[1]

In general habits of life, however, the tribes differed little. Their wants were few and easily supplied. With lines of wild flax fiber thrown deftly into the water they caught fish in abundance, and lying on tulle rafts—light bundles of reeds—the Nyumas skirted the shores of the lakes, or, crouching under a screen of bushes, ventured far out on the wind-swept surface.[2] From the wild cane growing about the edge of the lake they made floats by which their fishing lines were buoyed in deep water, while the ease-loving natives watched the bobbing specks from the shore. Sometimes the men made short hunting excursions into the Sierran foothills in search of bears, elk, deer, antelope, as well as the smaller animals, such as red foxes and squirrels. The sage-covered plains abounded with hares, and this little animal was made to play a very important part in the domestic economy of the Shoshonian tribes, for not all among them were good hunters, and the larger game offered a less certain supply of food than the hares, which were killed in great numbers by means of the bow and arrow, various snares and traps, and by "surrounds," in which many individuals took part. It was the hide of this animal, with its covering of fur, that, cut into strips and ingeniously sewn together into mantles, served as an admirable protection in winter. In the autumn, before the first frosts touched the pines, the women pulled the green, tight-closed cones from the trees and spread them in layers on the ground. The pitch-smeared husks burned hotly when a few embers were thrown among them, and the roasted nuts rattled out freely as the women struck the opening burs sharply with stones. A few weeks later the ripe nuts were thrashed from the boughs with long poles.[1]

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[1] Manuscript: "The Indians of Western Nevada." Stephen Powers, Special Agent Smithsonian Institution.

[2] Virginia City Territorial Enterprise, April 3, 1873. (Pyramid Lake and adjacent lakes.)

Their favored position on the line of a stream abounding in fish saved them from the terrible destitution which afflicted other tribes of the Great Basin during the winter season. They, of all others, had reason to trust in the care of a supreme and beneficent Deity, and naturally their ideas of an overruling Providence were more definite and well established.

As spring advanced and they could bask as before in the unclouded rays of a desert sun, stretching their fat bodies lazily on the sprouting grass, they bethought themselves of the existence of a spirit whose benign care they had experienced during the past and whose favor during the coming months they wished to gain. At the command of their chief they repaired to the bare top of some neighboring hill and built a circle of rude huts where the ground was most nearly level. In the centre of each of these circular piles of sage brush and pine boughs a small fire was kindled, and outside of each hut a heap of pine boughs blazed up brightly as the sun went down.[2] When the light of the burning boughs flashed over the hut-inclosed circle, a ring of men and women was silently formed, dressed in scanty mantles of rabbit skins or short clouts of willow fiber, with a few ragged feathers, it may be, in their coarse black hair. Then, at a given signal, the circle slowly revolved like a great water-wheel, from right to left, keeping time to a low monotonous chant, all standing close together with toes pointing toward the centre of the ring, and bodies circling around as a solid mass, the feet only appearing to move separately as they glided sideways a few inches with each rhythmical beat. From dusk to dawn this dance was kept up, the tired performers dropping out one by one to make room for others, and returning to their places as they became rested. The chants were varied, but all were addressed to the Great Spirit "Pah-Ah," water god or water giver, asking that he would grant them a good crop of pine nuts, or success in hunting and fishing. When the sun rose, the ring was broken, the fires extinguished, and the dancers returned to their every-day occupations of fishing and sleeping. Of this sort, varying in particulars but the same in general nature, were the religious practices of these tribes.[1]

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[1] Gold Hill News, September 19, 1873.—Stephen Powers.

[2] Territorial Enterprise, April 15, 1871.—"Indian religious dance and chants."

Such in brief was the life of the people whom Fremont found in the valley of the Truckee, for so he named the river in honor of their white-haired chief. Ascending this river his party crossed a low ridge of brown hills January 17, 1844, and reached the banks of another stream which flowed in a nearly opposite direction.[2] He had entered the fairest valley of the eastern slope, and yet how dreary was its aspect. To his right rose the dark, green wall of the Sierras, capped with irregular turrets of snow, and sloping upward steeply from the valley level. On the left, bare, reddish-brown hills were piled up stiffly, like round-topped sugar loaves, in a broad range, lying nearly parallel with the Sierras. Narrow winding ravines or cañons cut this hill chain at intervals, their steep slopes black with dry stunted cedars and underbrush, and between the ranges lay the flat ash-colored tract through which the little river ran, hidden from sight until the explorers reached its bank, though marked by patches of tall sycamores and plume-like poplars in a dotted line through the valley. From the foot of the hills to the river border the valley was a rolling plain of sage brush and sand in no way more fertile than the deserts which partly inclosed it. The little sierran stream ran like a courier from the mountains to the desert, only slackening speed at a few shallow basins where it overflowed the land in spring, half submerging the fringe of bushy trees and broad-leaved sedge. In these green marshes birds carolled and twittered gayly, resting, after their flight over the arid plains, in the fresh-leaved thickets or dipping with splattering wings in the cool water; but when Fremont passed by, the birds had flown and the oases were dreary groves of brown leafless trees, bristling evergreens, and shivering reeds. A few crows, beating the air with heavy wings in their low flight above the bleak stretches of sage brush, only added by their presence to the desolation of the scene. As the explorers passed down the valley they heard no sound except of their own voices and of the sand crushed under the feet of their horses, and they saw no signs of human life except straggling Indian lodges and fish-dams, for the natives had run away in ignorant terror to the hills from which in covert the passage of the little troop was curiously watched.[1]

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[1] Territorial Enterprise, April 19, 1871.—"Purport of chants, derived from old residents speaking Pah-Ute language fluently, as well as from members of tribe."
Territorial Enterprise, January 16, 1870.—"Pah-Ute religious rite."

[2] Fremont's Expeditions, p. 219.

Fremont named the valley Carson, in honor of his well-known guide, but did not explore the region thoroughly, as his pack animals were fatigued and foot-sore and he was anxious to cross the Sierras as speedily as possible in order to recruit at the hospitable ranch of John A. Sutter, in the valley of the Sacramento. Besides, there was nothing which tempted him to linger in sight of the barren hills, which were indeed ugly caskets for the deposit of treasure.

So far as is known, this was the first party of white men which traveled south along the eastern slope of the Sierras, though venturesome trappers had crossed different sections in their wanderings.[2] Whatever transient communication may have taken place, it is certain at least that none of the explorers and pioneers had any thought of remaining in this

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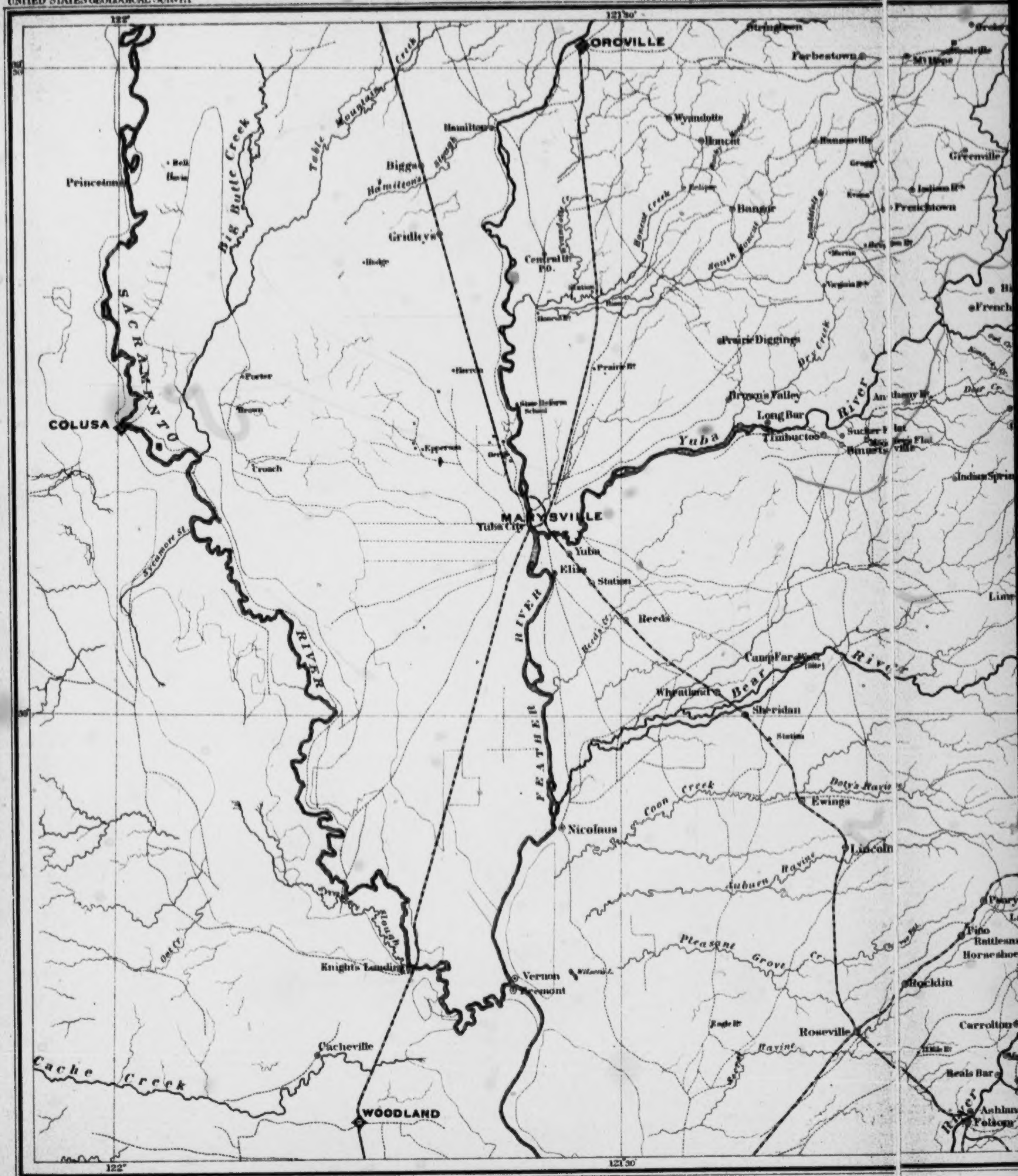
[1] Fremont's Expeditions, p. 219.

[2] Captain Joseph R. Walker, who followed the course of the Humboldt River in 1833, crossed from its slough directly to the river which bears his name, and climbed the Sierras by the pass at its head.—(Manuscript Records, Bancroft's Library.) The pioneers under Bartleston, who left the Kansas River in May, 1841, followed Walker's route quite closely, and entered the Sierras like him by ascending a branch of the Walker River.—("A Journey to California," General John Bidwell and Manuscript Records.) Jedediah S. Smith, the first white man who is known to have crossed the Great Basin, passed over the Sierras three times in 1826 and 1827, but crossed in all probability by routes south of Walker's Pass, though, he, too, skirted twice the course of the river now called the Humboldt, to which he gave the name of his Indian wife Mary.—(Manuscript Records, Bancroft's Library, San Francisco, Cal.; Oration of Edmund Randolph, delivered September 10, 1860, before the Society of California Pioneers.) Fremont noticed that the Indians at the mouth of the Truckee River had a few buttons, which may have been obtained from a former unknown visitor or indirectly from the parties of Bartleston and Walker


122°
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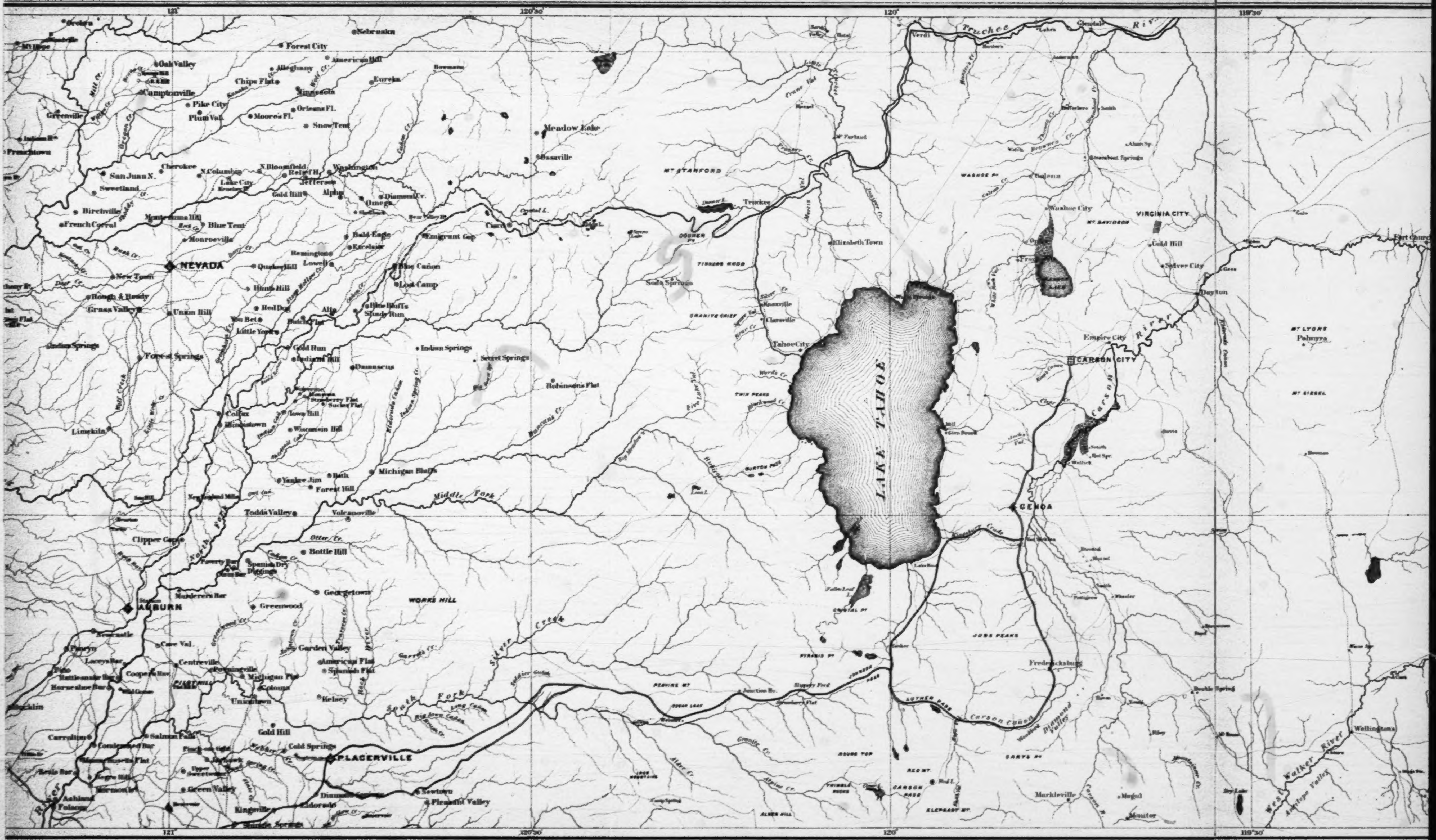
OROVILLE
Stringtown
Forbestown
Wyandotte
Hamilton
Biggs
Hamilton's Slough
Table Mountain Creek
Big Butte Creek
Princeton
Gridley's
Central H.
P.O.
Bangor
South Honcut
Honcut Creek
Frenchtown
Greenville
Prairie Diggings
Dry Creek
Bryan's Valley
Long Bar
Timbuctoo
Sucker Flat
Smartsville
Yuba River
Porter
Brown
Crouch
COLUSA
SACRAMENTO
RIVER
MARYSVILLE
Yuba City
Yuba
Elida
Station
Reeds
Reed's Cr.
Sycamore Sl.
FEATHER
RIVER
Camp Far West
Bear River
Wheatland
Sheridan
Station
Coon Creek
Doty's Ravine
Ewings
Nicolaus
Lincoln
Auburn Ravine
Pleasant Grove Cr.
Knights Landing
Vernon
Fremont
Rocklin
Roseville
Secret Ravine
Cacheville
Cache Creek
WOODLAND
Oat Cr.
Carrollton
Beals Bar
Ashland
Folsom
Pino
Rattlesnake
Horseshoe
Indian Spring
French
Lime
River

Topography from State Survey of California.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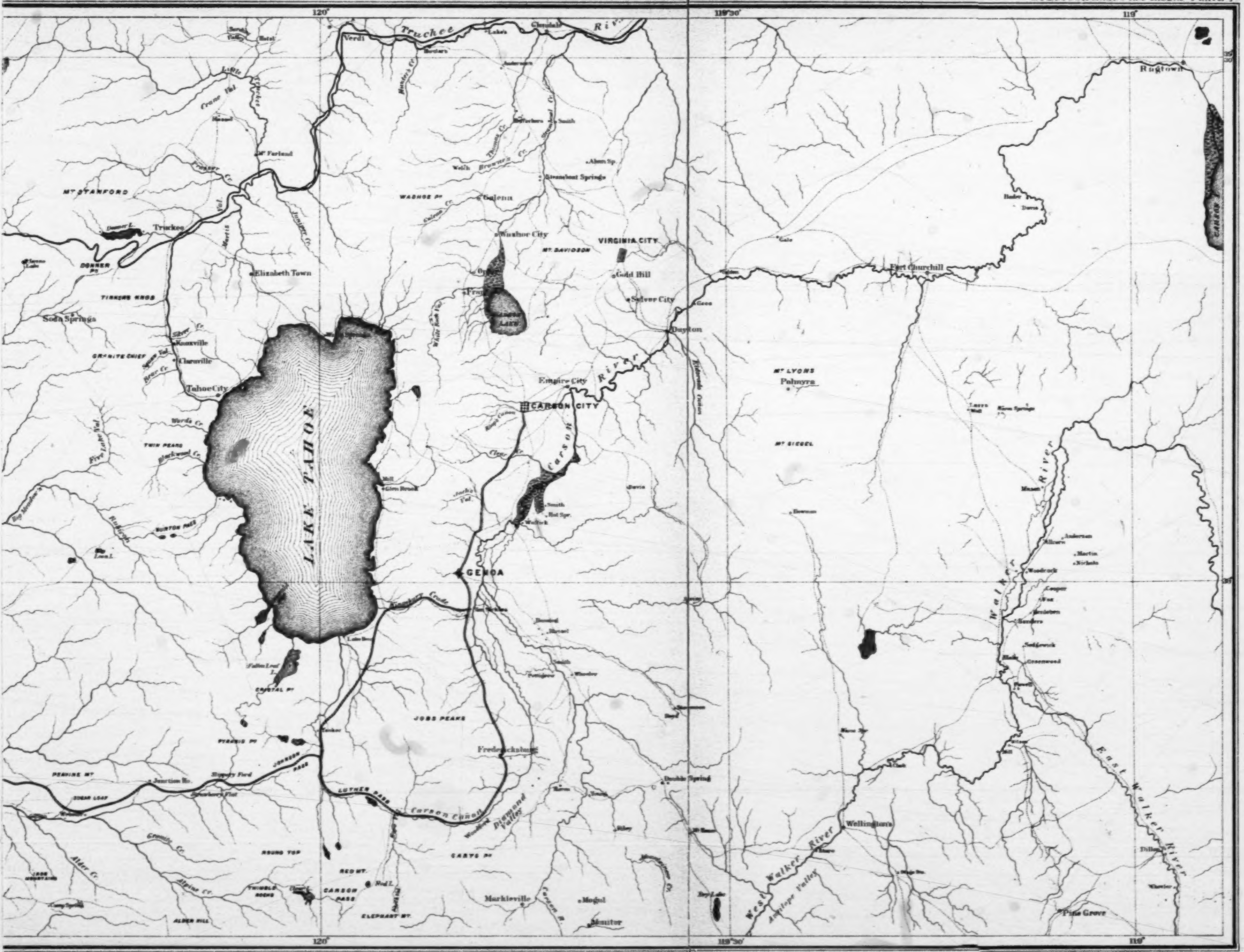
Nebraska
Forest City
American Hill
Oak Valley
Allegheny
Eureka
Chips Flat
Minnesota
Camptonville
Pike City
Orleans Fl.
Plum Val.
Moore's Fl.
Snow Tent
Greenville
Meadow Lake
Frenchtown
Bassville
San Juan N.
Cherokee
N. Columbia
N. Bloomfield
Relief H.
Washington
Sweetland
Lake City
Jefferson
Gold Hill
Alpha
Omega
Diamond Cr.
Birchville
French Corral
Montezuma Hill
Blue Tent
Monroeville
Bald Eagle
Emigrant Gap
Cisco
Excelsior
Remington
Lowell
NEVADA
Quaker Hill
Blue Cañon
New Town
Lost Camp
Rough & Ready
Grass Valley
Union Hill
Red Dog
You Bet
Alta
Blue Bluffs
Shady Run
Little York
Dutch Flat
Indian Springs
Gold Run
Indiana Hill
Forest Springs
Damascus
Secret Springs
Robinson's Flat
Limekiln
Colfax
Illinoistown
Iowa Hill
Sucker Flat
Wisconsin Hill
Yankee Jim
Bath
Forest Hill
Michigan Bluffs
Middle Fork
Todds Valley
Volcanoville
Clipper Gap
Otter Cr.
Bottle Hill
North Fork
Spanish Dry Diggings
Murderers Bar
Georgetown
Greenwood
AUBURN
WORKS HILL
Newcastle
Cave Val.
Garden Valley
Penryn
Centreville
American Flat
Spanish Flat
Coopers
Pilot Hill
Michigan Flat
Coloma
Uniontown
Rattlesnake Bar
Horseshoe Bar
Kelsey
South Fork
Silver Creek
Gold Hill
Salmon Falls
Cold Springs
Carrolton
PLACERVILLE
Mormon Is.
Green Valley
Newtown
Pleasant Valley
Diamond Springs
Kingsville
Eldorado
Ashland
Folsom
Shingle Springs
Truckee River
Verdi
Glendale
Crane Val.
M
Mt STANFORD
Donner L.
Truckee
DONNER Pk
TINKERS KNOB
Elizabeth Town
Soda Springs
GRANITE CHIEF
Knoxville
Claraville
Tahoe City
Wards Cr.
TWIN PEAKS
Blackwood Cr.
BURTON PASS
LAKE TAHOE
Glen Brook
Fallen Leaf L.
CRYSTAL Pk
PYRAMID Pk
PEAVINE MT
Slippery Ford
JOHNSONS PASS
SUGAR LOAF
Strawberry Flat
LUTHER PASS
Carson Cañon
JOBS PEAKS
Fredericksburg
Diamond Valley
ROUND TOP
RED MT
CARSON PASS
ELEPHANT MT
CARTS Pk
Markleville
Mogul
Monitor
WASHOE Pk
Galena
Washoe City
VIRGINIA CITY
MT DAVIDSON
Gold Hill
Silver City
Dayton
Empire City
Carson River
CARSON CITY
MT LYONS
Palmyra
MT SIEGEL
GENOA
Double Spring
Wellingtons
West Walker River
Antelope Valley

MAP OF THE PLACERVILLE ROUTE.

Julius Bien & Co. Lith.


120°
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Truckee River
Verdi
Glendale
Crane Val.
Little Truckee
Prosser Cr.
M^c Farland
M^T STANFORD
Donner L.
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DONNER P^s
Elizabeth Town
Soda Springs
GRANITE CHIEF
Knoxville
Claraville
Tahoe City
TWIN PEAKS
Blackwood Cr.
Wards Cr.
BURTON PASS
Loon L.
LAKE TAHOE
Glen Brook
Fallen Leaf L.
CRYSTAL P^K
PYRAMID P^K
JOHNSON PASS
PEAVINE MT
Junction Ho.
Slippery Ford
Strawberry Flat
SUGAR LOAF
Granite Cr.
Alder Cr.
Alpine Cr.
ROUND TOP
TRIMBLE ROCKS
ALDER HILL
RED MT.
CARSON PASS
ELEPHANT MT.
LUTHER PASS
Carson Cañon
Diamond Valley
JOBS PEAKS
Fredericksburg
CARTS P^K
Markleeville
Mogul
Monitor
WASHOE P^K
Galena
Washoe City
Steamboat Springs
Alum Sp.
Browns Cr.
Steamboat Cr.
Thomas Cr.
Hunters Cr.
Franktown
Ophir
Washoe Lake
M^T DAVIDSON
VIRGINIA CITY
Gold Hill
Silver City
Dayton
Empire City
CARSON CITY
Carson River
Kings Cañon
Clear Cr.
Jacks Val.
GENOA
Walleys
Hot Spr.
Genoa Grade
Lake Bigler
Double Spring
Fort Churchill
Ragtown
M^T LYONS
Palmyra
M^T SICOEL
Walker River
East Walker River
West Walker River
Antelope Valley
Wellingtons
Mason
Woodruck
Pine Grove
Dry Lake
Carson L.

LE ROUTE.

ELIOT LORD, in Charge.

desert region or of interfering with the possessory rights of its native inhabitants. The chance visitations scarcely produced a ripple in the placid current of their lives, and the passage of the train of Fremont was remembered only as a pleasant vision, which the old chief babbled about in his dotage to his grandchildren.[1]

The march of the Mormon Legion and of the few hundred regular troops who were hurrying forward to grasp the empire of the Pacific coast impressed them only as a novel spectacle. Even on the 2d of February, 1848, the tribe were angling for trout as placidly as ever, ignorant that by the signature of the treaty of Guadalupe Hidalgo their fishing grounds were transferred from one nation to another, and that they were thenceforth the wards of a more jealous guardian. In the natural but slow movement of farmers and herdsmen to the Californian valleys which followed the annexation of the new territory there was nothing which could alarm them, but the first cloud above their horizon appeared when the great stream of migration began to flow across the continent after positive information in regard to the gold placers of California was given, in the spring and summer of 1848.

The train of emigrants which crossed the plains in the following year had no eyes to see the possible riches of the land through which they were passing, for their faces were set steadfastly toward the glittering beacon beyond the Sierras. After leaving Salt Lake, indeed, there was little temptation to straggle out of the beaten path. Rocks and sage brush bounded the horizon on every side. Their provisions were failing, their cattle were worn out, and their only trustworthy guide in the desert was the narrow track of the multitude which had gone on before. They moved between Scylla and Charybdis. "We were cautioned," writes John Bidwell, the chronicler of the Bartleston party, in 1841, "that if we got too far south we would get into the Great Sandy Desert; if too far north, we would wander and starve on the waters of the Columbia, there being no possibility of getting through that way."[2]

If they loitered by any chance on the road, the story of the horrible fate of the Donner party was dinned into their ears and the perils of a late passage over the Sierras filled their minds. At every step the white, choking alkali dust rose in clouds. Their faces were burned and sore, their lips cracked and bleeding, and their bodies stiff and aching. The orderly file of white-topped wagons became often a straggling line; panting oxen dragged their heavy feet through the mire of the Humboldt slough only to fall dying on the sands of the 40-Mile desert, almost within sight of life-giving grass and water. Their wretched bodies were left to the coyotes and crows; wagon after wagon was abandoned, and the broken train crawled on to the valley of the Carson, the last oasis on their route. When the narrow stream with its fringe of grass and trees was reached, men shouted, women laughed and cried, and the dust-choked horses and oxen snorted and lowed with passionate thirst. The cattle rushed headlong into the river bed, and more than one emigrant followed their example and plunged his parched face into the water, drinking by gulps like the horses."[1] The narrow stretch of thin grass cut by a winding brook was transfigured by its contrast to the desert which they had crossed. Ten years later Horace Greeley called it as fair a valley as he had seen,[2] though he was whirled over the plains by relays of horses, while the emigrants of 1849 moved slowly and painfully with tired cattle. After a few days, however, the contrast appeared less vivid and the emigrants were eager to press on over the mountains to the land of gold. When the winter snows fell, cutting off the approaches, the valley was deserted except by the Indians, who had watched curiously during the summer the passage of this strange procession. Unlike the fiercer tribes to the north and south, the natives of the valley showed no disposition to repel the intruders. Favored ones of their number stalked about attired in white hats or tin basins, the gift of the emigrants, and the tribe quickly learned the three most attractive English words—whisky, tobacco, and bread.

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[1] Sarah Winnemucca.

[2] A Journey to California, p. 15.

The first wagon train which entered the valley in the following spring was a noteworthy little caravan. Leaving Salt Lake in April they found fresh pasturage along the banks of the Humboldt River, and their cattle suffered little, though the heavy canvas-topped wagons were dragged slowly over an untried track, as the beaten trail was flooded by the swollen river.[1] The party were nearly all Mormons, led by Thomas Orr, still living (1881), a hale, clear-eyed old man, at Duncan's Mills, Sonoma County, California. They were an orderly if somewhat stolid company, obeying orders without questioning why, drawing up their wagons at nightfall in a circle, and sleeping under the eye of their watchman as composedly as sheep about their shepherd. At the sink of the Humboldt, in sight of the snow-capped Sierras, the wall of the promised land, even this cool-tempered, well-fed caravan began to hasten their steps. Some of the youngest and best mounted men rode forward rapidly to make the first trial of the mountain passes, and the main body followed by crossing the 40-Mile desert and ascending the valley of the Carson.

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[1] David J. Staples, Vice-President of the Society of California Pioneers. San Francisco.

[2] Letter to New York Tribune from Placerville, Cal., October 19, 1859.

On the 15th day of May they halted for a few hours, at noon, beside a little creek flowing down from the range of hills which bounded the valley on the east. The cattle were turned loose to graze among the sage brush, and the women of the party prepared the simple dinner of bacon and potatoes.[2] William Prouse, a young Mormon, meanwhile picked up a tin milk-pan, and going down to the edge of the creek began washing the surface dirt. After a few minutes he returned and showed his companions a few glittering specks on the bottom of the pan.[3] The specks were gold dust, worth intrinsically only a few cents, thrown carelessly aside a few moments later,[4] but they were then transformed into precious and fruitful seed, for this pinch of dust was positive evidence of the existence of gold in the deserts of Western Utah, and that starting point once given, the exploration and development of the mineral resources of the land were assured.[5] The visionary prospector would willingly turn his back on the known riches of the Californian plains to wander over the alkaline sloughs and dusty plains of the unknown territory; the wilderness north, east, south, and west would be searched with greedy eyes, and the threads of gold would be traced up the cañon water-courses until the fountain-heads were reached and the hidden treasures of the mountains were brought to light. To the Mormon pioneers, however, the pinch of dust had no such far-reaching significance. They had scarcely heard of quartz mining and saw nothing attractive in the brush-covered hills with their jutting piles of tawny yellow rock—the bones of the land, as a fanciful writer declared,[1] showing through its rags. The creek sands were not rich compared with the Californian plains which their fancy imaged, and they were impatient to reach the El Dorado of their waking dreams. The train moved on therefore, up the valley again, until they met the advance division returning, who had left them at the sink of the Humboldt. The Sierras were reported to be impassable, and the united party accordingly turned back and were perforce content to remain three weeks longer in the valley.

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[1] Thomas Orr, John Orr, Duncan's Mills, Sonoma County, California; Placer Times and Transcript, June 29, 1850.

[2] John Orr, Thomas Orr.

[3] Diary of William Prouse, entry on May 15, 1859.

[4] William Prouse, living (January, 1881) in Kanosh City, Millard County, Utah.

[5] William Prouse declares that he made a still earlier discovery of gold dust in this same creek bed, in the autumn of 1848, on his return to Salt Lake from the South Fork of the American River. He lingered behind his party in order to prospect, and on coming up with the train again told its members, Joseph Bates, Frank Weaver, and Rufus Stoddard, that he would "show them a place, if they ever traveled that way again, where they could find gold."—(Letter of William Prouse, December 14, 1880.)

John Orr, the son of the Mormon leader, and several others returned to Gold Creek or Cañon, as they named the ravine where the first signs of gold were found by Prouse, and resumed prospecting. Orr, with one companion, Nicholas Kelly, worked up the cañon rapidly until, on the first day of June, they reached a point where the banks of the rocky ravine approached so near each other that a narrow passage only was left. Through this cleft the water of the creek flowed swiftly, falling over the rocks in tiny cascades. In a crevice at the edge of one of these little falls Orr thrust a butcher's knife and pried off a loose fragment of rock. The running water soon washed out the underlying dirt, and he saw a small golden nugget which the rock had covered. In a moment he held in his hand the first piece of metalliferous quartz from a district which has yielded the great bonanza of the present century.[2] Other bits of gold-bearing quartz and gold dust as well were afterward obtained, but the prospectors lacked tools and provisions, and, bent on reaching California, abandoned the cañon and crossed the Sierras as soon as the trail was sufficiently free from snow. But meanwhile other emigrants had entered the valley, and the new placer diggings were fairly opened.[3]

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[1] The Big Bonanza, p. 18.

[2] John Orr.

[3] California Daily Courier, July 8, 1850.

The news of the discovery of gold spreads from prospector to prospector precisely as the discovery of carrion is announced by the flight of vultures and crows. A horseman riding in haste toward some point off the beaten route is an intelligible sign and loadstone. So, for instance, two boys, Wand and Knous, while camping in the valley on the 1st day of August, saw a train of Mexicans plodding over the hills, carrying wooden bowls (*batia*), fashioned from tree trunks, on their backs, and driving small donkeys loaded with provisions and miners' equipments. Following on the trail of this party the boys came up with them at Gold Cañon and found them prospecting industriously.[1] The creek was a mere thread of water, but the Mexicans knew how to whirl the dry placer sand in their bowls till the wind blew off the barren dust and the gold specks could be scraped with horn spoons from the bottom of the batia. Don Ignatio Parades was the leader of the expedition, a troop of peon miners whom he had brought from Alamos, Sonora. He had been guided to the cañon by two native Californian prospectors and found the placer dirt fairly rich in gold. The peons worked contentedly therefore for some weeks, when they were obliged to abandon the placer, owing to the high price of supplies and the difficulties of transportation.

The overland movement during this year (1850) was like the march of an army. On June 18, 39,000 emigrants had been registered at Fort Laramie, and it was estimated that 60,000 had set out to cross the plains by the northern or South Pass route alone.[2] This mighty procession swept off every green thing in its path like a cloud of locusts, and by the month of August scarcely a blade of grass was to be seen along a stretch of 200 miles, from Martin's Fork to the slough of the Humboldt. For nearly the whole distance the route had become a continuous marsh, in which cattle were miring and dying by the hundreds. Within a radius of fifty miles from Humboldt Lake the country was literally strewn with carcases and the terrible effluvia from the rotting bodies tainted the air for miles around.[3] The price of flour rose in Carson Valley to $1.50 per pound and to $2.50 at the sink of the Humboldt.[1] Relief parties were sent out from the California towns, but the privations of the emigrants and the little mining settlements in the valley became extreme. Work was suspended and the placer deserted until the following year.[2] Thus the continuous existence of a mining camp at Gold Cañon may be said to date from the summer of 1851.

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[1] Thomas N. Wand, San Francisco, Cal.

[2] Report of Capt. William Findley, commanding Company B, U. S. Artillery, under Col. J. C. Fremont, August 29, 1860, to Colonel F. Foreman, Corresponding Secretary Relief Committee.

[3] California Daily Courier, July 8, 1850.

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[1] Report of I. Neely Johnson, in charge of expedition sent by Relief Committee from Sacramento to Col. F. Foreman August 9, 1850.

[2] M. W. Dixon, Harrisburgh, Alameda County, California; San Francisco Morning Call, February 8, 1880.

CHAPTER II.

THE GOLD CAÑON PLACER MINING COLONY.

The organization of the early western mining communities was a simple autonomy, and the little colony scattered along the line of this ravine was a model of its kind. The authority of the national government was merely a name. Until September, 1850, the Gold Creek placer was on an unorganized portion of the national domain, and it lay beyond the undescribed circle over which the Mormon governor and priest ruled as caliph, though nominally within the limits of the independent State of Deseret. The miners acknowleged no magistrate or arbiter, and the placer was apportioned according to a rude notion of equity, or prior occupation, or tacit consent. Additions were made to the colony from time to time, and parties set out on exploring expeditions to the headwaters of the Humboldt River and Goose Creek,[1] to the Walker River, 30 miles east of Carson Valley, and to the Truckee River, 40 miles north. Reports were brought back of rich surface diggings, but the majority of the miners preferred to remain at Gold Cañon. The gravel was worked with rockers and long toms, and yielded from $5 to $10 per day to the man on the average, nearly 200 being at work during the autumn of 1851.

Attracted by the opportunities of trading with the overland emigrants and by the fertility of the land along the banks of the Carson River, John Reese and other Mormon pioneers took up little farms and ranches in the valley during the spring of 1851, and found a ready market for their crops and cattle.[2] Their relations with the miners were at first friendly, although they had some cause to regard the placer workers as a camp of Ishmaelites; for when provisions were scanty, in the winter of 1852–3, the miners held a little meeting and concluded to supply their wants by the inexpensive method of a foray. Accordingly, a party made a sally from their camp and waylaid two trains moving from Salt Lake to Genoa, a little settlement which had grown up since May, 1851, about the farm of John Reese. The bold stand taken by the train men saved their bacon, for the assailants did not expect to meet with armed resistance and retired ingloriously.[1]

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[1] Placer Times and Transcript, September 26, 1851.

[2] Letter to San Francisco Morning Call, February 2, 1880, from E. M. Barnum, Salt Lake City, in behalf of Colonel John Reese.

The natural line of separation between the peace-loving, stolid Mormon farmers and the reckless, bustling placer miners was drawn more deeply by such acts as this. Besides, the cañon workers had little occasion to mingle with the people of the valley. A station house was built at the foot of the ravine in the winter of 1853–4, where provisions, liquor, clothes, and all needed supplies could be obtained, and a combined store, saloon, and bowling-alley was erected shortly afterwards at Maiden Bar, one and a quarter miles farther up the cañon.[2]

In the autumn, after the summer heat was passed, the creek swelled even before any snow had fallen and the seepage from the hills increased. Then miners began to flock to the placer from California and to work in the bed of the cañon and the neighboring ravines. As the water sources grew dry in May or June the placer was then generally abandoned, and only a few miners remained along the slender line of the creek. Whether the colony was large or small, however, miners and farmers stood aloof from each other, though without any positive antipathy.

By act of Congress, approved September 9, 1850, the territory of Utah had been established, but the Carson Valley settlers had been left without any district judge or magistrate until the formation of the county of Tooele, (March 2, 1852),[3] embracing a tract so extensive that the settlers on its western border found the county organization of but little use. The increasing importance of the valley settlements and their complaint of the lack of all legally constituted authority finally induced the legislative assembly of Utah to pass an act, approved January 17, 1854, organizing the county of Carson and defining its boundaries, north by Deseret County, east by the 118th parallel of latitude, south by the boundary line of Utah Territory, and west by California.[1] By the same act,[2] the territorial governor, Brigham Young, was "authorized to appoint a probate judge for the county when he shall deem it expedient, and this judge, upon his appointment, shall proceed to organize the county by dividing it into precincts and causing elections to be held by law to fill the various county and precinct offices." Orson Hyde, a prominent Mormon elder, was accordingly assigned to the charge of the county as probate judge, and set out with a small escort from Salt Lake (May 17, 1855) for the valley of the Carson.[3]

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[1] Democratic State Journal, January 11, 1853. Charles Barnard, Correspondent El Dorado News, December 20, 1852.

[2] William Naileigh, Virginia City, Nevada, prospector at Gold Cañon, 1853–1860.

[3] Acts and resolutions, Utah Territory, 1852.

By act of the Utah assembly, approved February 4, 1852,[4] the probate judge, besides discharging the ordinary functions of his office, was empowered to exercise original jurisdiction in both civil and criminal cases. He was also constituted chairman of the county commissioners,[5] and was intrusted with the arduous duty of conservator of the peace throughout the county.[6] There was a provision for an appeal, under bonds, from his decisions to the supreme court of the territory,[7] but practically Hyde, as probate judge, was the ruling magistrate of the district, though the miners showed no regard for his commission. But in the valley his arrival[8] was heartily welcomed.

The life of the simple people whom he there governed was not unlike that of the peasants of Acadie. They labored only to supply their humble wants. Even tempered as their draught oxen, and matching them also in slowness of thought and of action, they built their rude cabins of logs thatched with shakes, tilled their fields along the river banks, gathered their little crops, and troubled their minds about nothing except seed time and harvest. They looked up to Hyde as their spiritual as well as temporal director and received with unquestioning faith his inspired teaching. The harvest of 1855 was a meagre one, but the chosen people of Carson were fed by miraculous bounty. Hyde described this special providence in a letter to the Placer American,[1] announcing that "honey dew had fallen so bountifully on the small cottonwood along the river banks that the citizens were washing the leaves and boiling the syrup into sugar," and interpreted the prodigy by adding: "The people depended on their wheat to get groceries, but when the wheat failed, sugar fell from heaven." A Gentile physician and naturalist, who noted the same phenomenon, wrote to the Sacramento Union that this blessed manna was the "product of secerning tubules opening on the posterior part of the insect termed aphides or plant lice, of the family Hemipteræ." The miners laughed at the sugar from heaven, but the pious faith of the Utah peasants remained unshaken.[2]

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[1] Acts and Resolutions, Utah Territory, 1854. Section 1.

[2] Section 2.

[3] Mormon Church Records; Orson Pratt, sen., Historian of the Church, September 17, 1880.

[4] Acts and Resolutions Utah Territory, 1852, sections 27, 29.

[5] Section 34.

[6] Section 43.

[7] Section 30.

[8] June 15, 1855.

Their peaceful life was disturbed somewhat by the entry of a rough unruly set of ranchmen into Washoe Valley and upon lands lying along the Truckee River, who disputed the possession of the grazing pastures with the Mormons and the cattle-owning Indians; but the early settlers held their ground, in most instances, until they were commanded to gather up all their movable possessions, abandon their homes, and repair to Salt Lake City by a ukase of Brigham Young—issued when the safety of his church and people were menaced, as he averred, by the presence of the little army of United States troops under General Albert Sidney Johnson. The message reached the valley by express at nightfall, September 5, 1857. There was no thought of disregarding the summons or of questioning its necessity. At the bidding of their leader they would have entered the jaws of death with dull obedience, a temper midway between the unreasoning docility of sheep and the masterful sense of duty which drew on the Six Hundred at Balaclava. Accordingly, on the 26th of September, 1857, the Mormons of the valley, about 450 men, women, and children, all told, abandoned their farms and formed in a well-ordered procession, marshaled by captains of tens and hundreds, driving their cattle before them and carrying their household goods to the city across the desert.[3]

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[1] Sacramento Union, October 29, 1855.

[2] The party of Bartleston, fifteen years before, had eaten of this same manna, which the Indians were accustomed to scrape from the weeds and grass and mold into balls, crushing the living insects in their own gluten.—(A Journey to California, p. 16, and manuscript supplement.)

[3] Mormon Church Records; Orson Pratt, sen., September 17, 1880.

The Probate Judge, Orson Hyde, had gone to Salt Lake in the autumn preceding, leaving Carson Valley November 6, 1856. Shortly after his arrival at Salt Lake City, December 9, 1856, Carson County was attached to Great Salt Lake County for election, revenue, and judicial purposes, by act of the territorial legislature, approved January 14, 1857, and the probate and county court records were delivered over to the order of the probate court of Great Salt Lake County.[1]

The determining cause of this action is said by the authorized spokesman of the church to have been the disturbed condition of Western Utah at the time;[2] but, perhaps, a more sufficient reason may be found in the distance of the Carson settlement from the Mormon metropolis, the expenses of maintaining a separate county organization, and the unwillingness of the judge assigned to the district to cross a desert to hold his court.

The miners at Gold Cañon knew of the departure of the Mormon settlers and the loss of their judicial privileges, but regretted neither. They had never mingled sociably with the Mormons of the valley, and only a few of the departing settlers had attempted to join them in mining on the cañon.[3] No cases were submitted to Judge Styles, and when application was once made to Orson Hyde to adjust a dispute he sensibly remarked that he "didn't propose to mix himself up with any Gentile messes."[4] The miners, left to their own devices, contrived to live together amicably as a rule. Disputes were settled informally by reference to associates and friends, or each contestant named an arbitrator, and the two referees so chosen selected a few associates to sit with them in judgment upon the case.

Few occupations are more monotonous and colorless than the work of a scattered colony of placer miners along the line of a creek. The Gold Cañon miners toiled in the usual way with long toms and rockers, washing the sand from the various bars, and when the richest placers were exhausted, carrying sacks and buckets of earth from the neighboring ravines to the nearest spring or to the creek itself. At nightfall they would return to their huts, cook their simple suppers of bacon and potatoes, with bread and tea, smoke a pipe or two, and then wrap themselves up in their blankets to sleep until daybreak. In summer most of the huts were merely heaps of brush, rather inferior to the Pah-Ute lodges. The winter cabins were usually of rough stones, plastered with mud and covered with canvas, boards, or sticks, overlaid with earth. Sometimes holes were made in the walls for ventilation, but generally the cracks and open doorways were sufficient. Glass windows were an unthought-of luxury. Some of the better cabins had small iron stoves and funnels, but the majority of the miners were content with stone fire-places and rude cranes. A nondescript ball was sometimes given at one of the stations, but few of the miners succeeded in varying the staple amusements of gambling and drinking. On Sundays the men "rested" usually — that is, "washed their clothes and cleaned up their cabins."[1]

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[1] Sacramento Union, September 28, 1857, October 5, 1857.

[2] Mormon Church Records; Orson Pratt, sen., September 17, 1880.

[3] Mormon Church Records; Orson Pratt, sen., Historian.

[4] Mrs. L. M. Dettenrieder, Virginia City, Nev.

Some of the miners were fairly expert hunters, and used to supply their friends at times with a steak of antelope or mountain sheep, which they shot among the neighboring hills. The ravines of the range were then (1851–'57) covered with a thick growth of small cedars, pines, and underbrush, which afforded a good covert for deer and hares, game which was quite abundant until the Indians and the miners thinned their numbers. Except when a supply of fresh meat was thus obtained the miners, as a rule, contented themselves with bacon or salt beef, which they purchased at the stations.[2] Occasionally a ranchman from the valleys would drive a cow or calf up the cañon, slaughter the animal at some convenient point and sell portions as required, or roast the whole by a barbecue.[3] Potatoes, almost the sole vegetable in demand, were also purchased from the farmers or ranchmen in the valleys. All other supplies were bought at the station stores.

Generally, a sufficient variety was kept in stock, and the prices were not exorbitant considering the extraordinay cost of transportation across the Sierras or over the plains. Until grist-mills were built in Carson Valley in 1854,[1] flour was purchased from the emigrant trains at prices ranging from 4 cents to $2.50[2] per pound, in proportion to the scarcity and demand. After the valley farmers began to grind their own wheat and the failure of supplies was no longer dreaded, the market price of flour was usually 15 cents per pound,[3] and potatoes which in early years (1850–'53) sold for $1 per pound fell to 5 cents per pound. When crops grown in the valley were offered for sale in 1854, barley was sold at 44 cents per pound; beef, at from 12 to 18 cents; coffee and sugar, for 50 cents per pound.[4] But it sometimes happened that supplies of certain necessary articles were exhausted when the stock could not be renewed, as in the winter of 1856–'57, when many miners were without boots or had none fit to be worn.[5] The only means of obtaining a supply was through the expressman, John A. Thompson, who alone ventured to cross the Sierras in the heart of winter. He offered $1.50 per pound to any man who would accompany him back from Placerville and carry freight to Gold Cañon, but could find no one willing to face the perils of the passage, and few indeed could have made the attempt with success except men like this stalwart Norwegian, trained to endure extremes of cold and fatigue, and skimming fearlessly over snow-filled crevasses on his wooden shoes. In crossing from the valley he met four tired men 25 miles from Placerville, who had advanced only 10 miles in three days and had not as yet fairly entered the snow belt. As the light-footed courier slid past, they asked him despondingly whether they were almost through the snow. "There are 45 miles more of it," he cried back, without slackening pace.[6]

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[1] Richard M. Bucke, Superintendent Asylum for the Insane, London, Canada, engaged in mining at Gold Cañon, 1857. Letter dated October 22, 1880.

[2] William Nalleigh, Virginia City, Nev., prospector in Gold Cañon, 1853–'59.

[3] Sacramento Union, November 8, 1854.

Remembering the wearisome and terrible passages of Walker, Bidwell, Fremont, the Donners, the Raymond brothers. and others who risked their lives in the sierran snows, the frequent and fearless trips of Thompson seem marvelous at first thought; but these parties were generally unfamiliar with the route to be traversed, or worse still, were heavily handicapped with baggage or feeble companions; while the blond Norwegian, a model of manly vigor, could run across the Sierras, scarcely pausing for breath. He carried neither blankets nor overcoat—not even provisions, except a small parcel of dried beef and crackers in the bosom of his flannel shirt, which he eat as he ran. For drink he had a handful of snow caught up as he skimmed along, or the water of some mountain spring. At night he made his bed of pine boughs and slept on the snow field.[1] Only the fiercest storms could bar his passage. He ran from Carson Valley to Placerville, a distance of 100 miles, in three days, and returned in two, bearing a heavy load[2] of mail and baggage over the pass.[3] During the winter months this mountain Mercury was almost the sole medium of communication between the miners in their inaccessible cañon and the rest of the world.

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[1] Placer Times and Transcript, May 18, 1852. Democratic State Journal, January 6, 1853.

[2] Mrs. L. M. Dettenrieder.

[3] Sacramento Union, December 10, 1856.

[4] Democratic State Journal, May 6, 1854.

[5] Sacramento Union, March 9, 1857.

[6] Sacramento Union, March 9, 1857.

Their wants, it is true, were simple. They cared only to fill their canvas bags with gold dust as quickly as possible and migrate to a pleasanter country. They required no courts, churches, alms-houses, prisons, nor any other of the institutions of civilization. Once, it may be noted, they were somewhat at a loss for a clergyman, but the lack was supplied by the wit of a woman. William Dover, a miner on the cañon, met by chance Rachel Albright, a young woman crossing the plains with an emigrant train in 1854, and wished to make her his wife. She consented, and only one obstacle barred their union. There was no clergyman or civil magistrate in the valley and the young woman was not willing to waive the marriage ceremony for the time being, as was suggested. It appeared probable that the lovers would be parted, perhaps forever, as the emigrant train would soon cross the Sierras, and Dover was not disposed to abandon his productive claim on the cañon for a less certain prize. In this strait Mrs. James B. Ellis, the wife of a pioneer miner, undertook to unite the pair by a civil contract sufficiently formal to satisfy the scruples of the bride. Rachel Albright accepted the offer and received a certificate of marriage from Mrs. Ellis; a duplicate contract was given to the bride's brother, and Mrs. Ellis reserved a copy herself.[1] The legality of the marriage rite was never questioned by the bridegroom or bride, though their union was ended by a divorce a few years later.

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[1] Virginia City Territorial Enterprise, February 13, 1876.

[2] Load weighing often more than 100 pounds. (Virginia City Territorial Enterprise, February 13, 1876.)

[3] Sacramento Union, December 10, 1856. "Thompson's first trip from Carson Valley to Placerville was made in four days."

The miners could not attribute, therefore, the decadence of their colony on the cañon to the presence of a clergyman or the erection of a church, which prospectors commonly regard as a bad omen. Yet it was becoming evident, in 1857, that unless new discoveries were made the cañon would soon be abandoned. Maiden Bar, Greenhorn Point, and other rich local placers had been "cleaned up to bed rock" several times and the average yield since 1855 was yearly decreasing. Exactly how much gold had been obtained cannot be learned, but an approximate estimate can be made, based on the testimony of a trustworthy prospector who mined on the cañon from 1853 to 1859, confirmed by a collection of reports from the Sacramento Union and other California newspapers.[2]

When James B. Ellis reached the cañon in the summer of 1853 he took up a claim 100 feet long near the entrance of the ravine, which he worked from the fall of 1853 till June, 1854, employing two assistants and using a "long tom." The claim yielded an average return to each man of from $12 to $20 per day. Seven working months from November 1, 1853, to June 1, 1854, of twenty-six days each = 182 days × 3 (number of miners) × $16, average daily earnings = $8,736. But this claim was a new and uncommonly productive one, whose yield is merely cited as an example of the best class on the cañon.

The average earnings of the miners were only from $4 to $5 per day individually, and the following table is prepared with due allowance for the shifting numbers of the colony and the inferior yield of the poorer placers:[3]

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[1] Mrs. James B. Ellis, now (1881) Mrs. L. M. Dettenrieder, Virgina City, Nevada.—Virginia City Territorial Enterprise, June 13, 1875.

[2] William Naileigh, Virginia City, Nevada, 1880.

[3] Placer Times and Transcript, September 26, 1851; Democratic State Journal, May 18, 1852; Placerville Correspondent Democratic State Journal, January 6, 1853; Placer Times and Transcript, April 7, 1853; Sacramento Union, November 18, 1854; Sacramento Union, February 4, 1856; Report of John A. Thompson, Sacramento Union, April 21, 1857; Report of John A. Thompson, Sacramento Union, May 20, 1857; Report of John A. Thompson, Sacramento Union, January 9, 1858; Sacramento Union, March 13, 1858, Report of John A. Thompson.

TABLE OF BULLION PRODUCT.—GOLD CAÑON.

Year.	Number of working days.	Number of miners.	Daily earnings.	Total yield.	
1850					$6,000.
1851	100	120	$5		60,000.
1852	120	130	5	78,000	100,000.
	220	20	5	22,000	
1853	120	90	5	54,000	76,000.
	220	20	5	22,000	
1854	120	130	5	78,000	100,000.
	220	20	5	22,000	
1855	140	180	4	100,800	118,400.
	220	20	4	17,600	
1856	120	100	4	48,000	70,000.
	220	25	4	22,000	
1857	70	80	2	11,200	18,200.
	140	25	2	7,000	

The notable falling off in the returns during the last year was due not only to the fast approaching exhaustion of the placers, but to the scanty supply of water, for during this season very little snow fell.

The great body of miners had contented themselves with the small but certain returns from the bed of the cañon and the creek delta at its lower end, but there was one noteworthy exception to this general practice.[1] Two young Americans, Ethan Allen and Hosea Ballou Grosh, made a persistent and well-planned effort to trace the metal-bearing ledges of the district. The story of their work is a memorable scene in the drama of mining industry. Never was the strange allotment of the favors of fortune more vividly set forth than in their fate as contrasted with the blundering luck of the ignorant prospectors who followed in their footsteps. They were brothers, sons of a Universalist clergyman, living in 1849 in Reading, Pa. Allen Grosh, the elder of the two, was born in 1824 (November 11th), and his brother in 1826 (August 3d), at Marietta, Pa. The news of the discovery of gold in California stirred their minds with the same impulse which was given to thousands like them, and they joined a party which set out for the Pacific coast, sailing from Philadelphia on the 28th of February, 1849, for Tampico, Mexico. A storm which struck their vessel before reaching port, driving it back on its course, and a bolt of lightning which shivered a mast, might have seemed an ominous outset to their expedition,[1] but the spirits of the two young men were too buoyant and self-reliant to be weighed down by presages of evil. Reaching Tampico at length, on the 26th of March, they crossed overland to San Blas,[2] enduring with invincible good humor and patience the bitter discomforts of the overland journey, scarcity of water, a burning sun, "a barren country with few trees and these almost leafless, stampedes and straying of mules and horses, poor provisions, insults of all kinds day and night, bad roads and in places no roads, and attacks of malarious fever and dysentery."[3]

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[1] The peon miners had prospected on the neighboring hills in 1850 and found abundant traces of silver, but owing to the lack of supplies, as has been narrated, and their expressed conviction that "a gold mine is needed to work a silver one," they made no attempt to utilize their discoveries.—(Thomas N. Wand, San Francisco, Cal.)

The contractor who had undertaken to provide their transportation to California, and had been paid in advance, declared his inability to fulfill his agreement while the company were still 80 miles from the west Mexican coast, but nevertheless, the party struggled on, reaching San Blas upon the 23d of June. Like most of their companions, the Grosh brothers had not thought it necessary to bring a surplus to a land of gold after prepaying their passage, and were left behind accordingly by the steamship which touched at San Blas on its way up the coast shortly after their arrival. Nothing discouraged, they contrived to obtain a steerage passage on the bark Olga, which sailed from San Blas on the 12th of July, by selling their share of the mules and horses, taken by the concession of the defaulting contractor, and pawning the wagons and harness as security for the balance of the passage-money. On the 30th of August the barque entered San Francisco Bay, but Hosea Grosh was still so ill with dysentery and malarial fever, contracted on the passage through Mexico, that it was several weeks before he was able to do any work. During his sickness his brother cared for him most tenderly and patiently, although he had chafed, naturally, at the extraordinary delays of the journey and longed to set off with the parties departing daily for the gold-fields. When Hosea regained his health it was necessary to provide an outfit, and the brothers were not able to begin work as prospectors until the summer of the year following (1850), in El Dorado County, California.

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[1] Alpheus Bull, Vice-President Fireman's Fund Insurance Company, San Francisco, Cal.

[2] Richard M. Bucke, Superintendent Asylum for the Insane, London, Ontario, Canada.—Manuscript Letters and Journals of the Grosh Brothers.

[3] Richard M. Bucke.

Their chances of success, based on personal fitness for their undertaking, were unusually fair. Others were young, strong, and hardy, like them, but few of their fellow workers were so observant, industrious, and temperate. They had studied and reflected more than most men of their age, and knew something at least of elementary chemistry and mineralogy.[1] Always cheerful, hopeful amid all discouragements, honorable in small things as in great, they gained the respect of all their companions, though they were somewhat reserved in disposition and confided in few intimate friends. The miner who knew them best has written of them that they were "in truth religious, not apt to talk about it, not wedded to any special dogma, but filled with that genuine religion of the heart which is the salt of the earth, and which keeps whoever possesses it, as it kept them, fearless, earnest, and pure."[2]

Their first season at the mines was moderately profitable. They saved $2,000 above their expenses, but afterwards spent all their savings to no purpose in diverting the current of a river from its bed in order to wash the sands of its old channel. In 1853, after two years of generally unremunerative work, they crossed the Sierra Nevadas for the first time,[3] and joined the parties of miners at work along the line of Gold Cañon. Here they made only a bare living until the autumn of 1854, when they returned to California in order to prospect for gold-bearing quartz-veins at Little Sugar Loaf, in El Dorado County.

Their bad luck continued. On the 31st of March, 1856, they wrote to their father: "Ever since our return from Utah we have been trying to get a couple of hundred dollars together for the purpose of making a careful examination of a silver lead in Gold Cañon. * * * Native silver is found in Gold Cañon; it resembles thin sheet-lead broken very fine, and lead the miners suppose it to be. * * * We found silver ore at the forks of the cañon. A large quartz vein shows itself in this situation."

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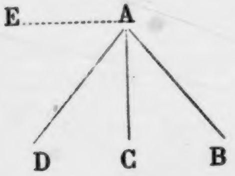
[1] Alpheus Bull, San Francisco, California.

[2] Richard Bucke, London, Ontario, Canada.

[3] Mrs. L. M. Dettenrieder, Virginia City, Nevada.—Letters of Allen and Hosea Grosh.

They went to Utah for the second time in September, 1856, staying at Gold Cañon until the end of October. In a letter dated November 3, 1856, they wrote: "We found two veins of silver at the forks of Gold Cañon. * * * One of these veins is a perfect monster." And again, November 22: "We have hopes almost amounting to certainty of veins crossing the cañon at two other points."

Returning from El Dorado County, where they had passed the winter of 1856-'57 in prospecting for quartz lodes without success, they revisited Gold Cañon in the spring of 1857. On the 8th of June, 1857, Allen wrote: "We struck the vein (in Gold Cañon) without difficulty, but find some in tracing it. We have followed two shoots down the hill, have a third traced positively, and feel pretty sure that there is a fourth. The two shoots we have traced give strong evidence of big surface veins. The following is a diagram of the set of veins:



"A seems to be the center from which all seem to radiate; B we have traced by boulders; C we have struck the end of; D the same; E is uncertain, though the evidence of its existence is tolerably strong; B A C may be the true vein and the shoots; D A E may be superficial spurs. We have pounded up some of each variety of rock and set it to work by the Mexican process. * * * The rock of the vein looks beautiful, is very soft, and will work remarkably easy. The show of metallic silver produced by exploding it in damp gunpowder is very promising. This is the only test that we have yet applied. The rock is iron, and its colors are violet-blue, indigo-blue, blue-black, and greenish-black. It differs very much from that in the Frank vein, the vein we discovered last fall. The Frank vein will require considerable capital to start. The rock is very hard and the vein very much split up. The present vein lies very compact as far as we have examined it; not a leaf of foreign rock in it."

August 16, 1857, Allen wrote again from Gold Cañon: "Our first assay was one-half ounce of rock; the result was $3,500 of silver to the ton, by hurried assay, which was altogether too much of a good thing. * * * We assayed a small quantity of rock by cupellation from another vein. The result was $200 per ton. We have several other veins which are as yet untouched. We are very sanguine of ultimate success."

During the summer of 1857, as during the previous years, the brothers supported themselves by washing the cañon sands for gold while prospecting industriously for veins of silver ore. They made no attempt to develop any of their discoveries, except by examining the intervals between jutting boulders in order to trace the lines of surface croppings, for they had no money and knew that it was impossible to open a vein properly without capital. Their claims were fairly productive, but several hundred yards distant from the cañon creek, so that they were obliged to transport the dirt in sacks to the water, and this labor consumed so much working time, which they were anxious to devote to their search for silver, that they washed only enough sand to pay for their food.

Placer washing was merely a needful drudgery. The search for hidden veins of ore has an indescribable fascination, which beguiles and holds fast the most stolid of men. The Grosh brothers, ardent and ambitious, grudged themselves the necessary food and rest, and would fain have spent every moment in rock chipping and assaying. Their brightening prospects of success goaded them to impossible exertions; for as soon as they should succeed in determining the existence and course of a rich ore-bearing ledge, they were promised the money requisite to develop it by George Brown, a cattle-trader of Carson Valley.

The "black rock," which assayed $3,500 to the ton, "presented so many difficulties," wrote Allen, September 11, 1857, "that we lost our patience, and, relying on Brown, we dropped everything, determined to master it. The very day we had determined it we heard the first news of his murder." Fortune had again disappointed them, but the brothers did not lose heart. Mrs. L. M. Dettenrieder, who had faith in the men and their work, promised to assist them with money which she had saved, and they planned also to secure the help of some enterprising capitalist in California. Whether they would have succeeded in this endeavor, and whether their seven years of persistent toil would have been crowned with reward, can never be known.

On the 19th of August, three days after Allen Grosh's hopeful letter was written, Hosea struck a pick accidentally into his foot just below the ankle, making a deep and painful wound. There was no physician in the cañon camps, and it was with difficulty that a few simple lotions were obtained to poultice the wound. In spite of his brother's unremitting care and the kindly attentions of the good-hearted miners in the neighborhood he became very ill. Gangrene set in, and on the 2d of September he died.

The loss of his brother was a crushing affliction to Allen; yet he bore even this trial with noble resignation. On the 7th of September he wrote to his father of Hosea's accident, illness, death, and burial in the remote Utah cañon: "In the first burst of my sorrow I complained bitterly," he continued, "of the dispensation which deprived me of what I held most dear of all the world, and I thought it most hard that he should be called away just as we had fair hopes of realizing what we had labored for so hard for so many years. But when I reflected how well an upright life had prepared him for the next, and what a debt of gratitude I owed to God in blessing me for so many years with so dear a companion, I became calm and bowed my head in resignation. 'O, Father, thy will, not mine, be done.' Our happy faith in the perfection of God's wisdom and goodness will be your consolation as this cloud passes over your head, for well I know your heart is full of the great hope which caused Paul to shout in triumph, 'O death, where is thy sting! O grave, where is thy victory!'"

On September 11th he wrote again: "I feel very lonely and miss Hosea very much—so much that at times I am strongly tempted to abandon everything and leave the country forever, cowardly as such a course would be. But I shall go on; it is my duty, and I cannot bear to give anything up until I bring it to a conclusion. By Hosea's death you fall heir to his share in the enterprise. We have, so far, four veins. Three of them promise much."

After writing this letter he set to work unremittingly to pay off the debt incurred by Hosea's sickness and burial. By the middle of November he had paid all creditors and was ready to cross the Sierras, as he had intended to do before the first snows fell. The death of his brother had so delayed his preparations that he was obliged to attempt the passage too late in the season for safety; but he was most anxious to leave a place associated with a grief so recent and so bitter, and he felt more deeply than ever the necessity of interesting capital in developing his ledge locations. Accordingly he set out with one companion, a young prospector from Canada, Richard M. Bucke, to cross the mountains into California on the 20th of November.

The miseries of that terrible passage are told with the simple minuteness of a daily record by his companion. The two adventurers reached Lake Tahoe, near the head of the Truckee River, only to be overtaken by a storm which obliterated the trail, buried the surrounding mountains under deep snow-drifts, and hemmed them in by their solitary camp-fire in Squaw Valley as within the walls of a prison.

Their provisions were exhausted. To turn back appeared as difficult and dangerous as to press on. After fruitless attempts to follow the trail, they killed the donkey which they had led with them, as he could not struggle through the snow, took as much of his flesh as they could carry, and set out by the most practicable course across the range. They climbed from point to point, always waist-deep in snow, dragging themselves up by bushes and jutting rocks, struggling on desperately until they reached the summit. The day was clear (November 29th), but the wind blew so fiercely and coldly in their faces on the top of the bare ridge that they were nearly benumbed before they could gain shelter under the trees on the western slope. Their matches were wet and spoiled in Squaw Valley. After repeated trials they lighted a fire by a flash of powder from their gun and warmed themselves. But a second storm broke over them. The snow was so soft that they could not use the rude snow-shoes which they had made, and they could not follow the trail along the ridge in the face of the keen wind. In the midst of the storm they lost their way completely, for they could not see two hundred yards before them. Their gun was wet and rusty and could not be fired, so that for the sake of the needful warmth they burrowed holes in the snow, and thus passed the night of the 2d of December. Their scanty load of donkey flesh was eaten, and want of sleep and food was beginning to weaken them; yet they pushed on until they reached the Middle Fork of the American River.

They followed the course of this stream as closely as was practicable, but could find no inhabited cabins or muddy creeks showing signs of miners at work. On the 5th of December they did not feel hungry, but had a "horrible sinking feeling in the region of the stomach," which Dr. Bucke remembered vividly twenty-three years later. He was the strongest of the two, but "Allen," as he writes, "was the least inclined to give up." He proposed on this day, the 5th, "to lie down and die. Allen would not listen to me, but said 'no, we will keep going as long as we can.' That night, the 5th of December, we made our bed in silence and lay down."

The boy Bucke had strange visions. Perishing from hunger, he dreamed of feasting on quail and all manner of delicacies.[1] In the morning the two men were hardly able to crawl along. "We went almost as much on our hands and knees as on our feet." Hope was dead, but they were resolved to drag themselves on while they could move hand or foot. They were not afraid to die, but they could not bear the thought of loved ones at home waiting vainly for their return and brooding over the horrors of their clouded fate.[2] This unselfish remembrance nerved their weak limbs as they crept side by side through the snow. From daybreak till noon they had crawled less than a mile and their eyes were closing from overmastering faintness, when they heard the bark of a dog and saw a thin wreath of smoke in the air.

They were rescued, but too late, for their feet were badly frozen and they could neither eat nor sleep. Allen Grosh died on the twelfth day after reaching the mining camp — the Last Chance. Only a few months before he had written his father: "Hosea and I had lived so much together, with and for each other, that it was our earnest desire that we might pass out of the world as we had passed through it — hand in hand."[3] This wish, at least, was granted. United in life, in death they were not divided.

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[1] Alpheus Bull, Vice-President Firemen's Fund Insurance Company, San Francisco, Cal.

[2] Richard M. Bucke.

[3] Letter of Allen Grosh, September 7, 1857.

One of Bucke's feet was rudely amputated at the ankle joint and a portion of the other was also cut off. He reached the hospitable door of Alpheus Bull, in San Francisco, hobbling on his bandaged stumps, and by Mr. Bull's assistance he was carried to his home in Canada, from whence, on recovering health, he went to Europe to pursue studies in medicine.[1]

He had seen the course of one of the veins at Gold Cañon and a button of silver from an assay made by the Grosh brothers, but knew little definitely of the location or extent of their discoveries. George Brown, the only man who had any accurate information in regard to the ledges which they had located, had been murdered,[2] and the papers of Allen Grosh, in which his claims were defined and recorded, had been thrown away with everything else, except a few handfuls of meat, when the desperate men were struggling to pass the summit of the range, and lay buried many feet under the sierran snow.[3] Mrs. L. M. Dettenrieder declares positively that Allen Grosh pointed out to her, as she stood by his cabin, the general location of one of his ledges on the eastern slope of the largest mountain of the range at the head of Gold Cañon, on the day when she brought to him the news of his friend Brown's death. If her testimony is accepted, and her character has never been impeached, the Grosh brothers died on the very threshold of fortune; but she could not identify the ledge, and, on learning of the death of the brothers, all thought of prosecuting the work further was abandoned. Their years of patient and intelligent search were therefore fruitless, and it was left for a lazy, drunken prospector to stumble upon the prize for which the brothers had striven.

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[1] Richard M. Bucke, Superintendent Asylum for the Insane, London, Canada.

[2] Sacramento Union, August 14, 1857.

[3] R. M. Bucke.

CHAPTER III.

THE DISCOVERY OF THE COMSTOCK LODE.

In January, 1858, less than a month after the death of Allen Grosh, some of the miners at Gold Cañon organized a quartz mining district, the first[1] on the eastern slope of the Sierras north of the Mexican border line, in a meeting held at Johntown, a little settlement made in 1855, two miles from the foot of the cañon. A recorder, William H. Dolman, was elected, and a few simple regulations were enacted to govern the location and development of mining claims.[2]

The Columbia Quartz District, as it was styled, was bounded by lines beginning at the mouth of Six-mile Cañon; thence up Carson River to the mouth of Clear Creek; thence to centre of divide between Eagle and Washoe Valleys; thence north along the centre of said divide to the north branch of Six-mile Cañon; thence down said cañon to place of beginning.

The recorder and three or four others who were most active in calling the meeting had recently arrived from Placerville, Cal., and the laws drafted were substantially a reproduction of the Placerville Quartz Mining District laws.[3]

Shortly after the organization of this district a few rude attempts were made to crush the rock croppings near the cañon and extract their metallic contents. A small association, self-styled the Pioneer Quartz Company, located several lodes, but worked only one, the Moselle,[1] on Pioneer Hill, directly east of the narrowest part of the cañon, the Devil's Gate. A rough road was made leading from the ledge to the cañon below, and an arrastra was built to reduce the quartz. Four or five tons of rock were hauled down into the ravine and all put into the arrastra at once. The two mules attached to the beam walked around in a beaten circle for three weeks and succeeded in pulverizing about one-tenth of the heap of broken rock. At the end of this time the resulting amalgam was retorted and three and one-half ounces of bullion was obtained, which was sent to Sacramento for assay. A return of $42 in gold was made, and the Pioneer Quartz Company, after a rapid comparison of their debit and credit accounts, went back to work at the placer diggings.[2]

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[1] The Sonora Exploring and Mining Company, whose headquarters were at Tubac, began explorations in 1853 throughout Sonora and the tract known as the Gadsden Purchase, and opened several mines within the territory of the United States. Several veins of rich ore were developed, but as all mining operations were carried on by the employés of the company no mining districts were organized, and the influence of the enterprise was not far reaching, though the editor of the San Diego Herald looked upon the opening of these veins of ore as the beginning of a new era of mining in this country.—(San Diego Herald, July 25, 1857; report of Col. Chas. D. Preston, Manager Sonora Exploring and Mining Company.)

A ledge containing silver ore was discovered near the East Fork of the Carson River in the summer of 1857 (Sacramento Union, August 24, 1857), but no systematic attempt was ever made to develop it, though it was vaguely reported to be very rich, and few prospectors had the curiosity to inspect it.

[2] Nevada Directory, 1861; J. Wells Kelly, Compiler.

[3] William Naileigh, Virginia City, Nev.

Meanwhile, by a freak of chance, fortune fell into the hands of a western Rip Van Winkle. James Finney, a native of Virginia, whence his sobriquet of "Old Virginny," had been working in the cañon since 1851,[3] and was accounted by the prospectors an oracle in mining matters, so that if he cast his eye upon a jutting rock, or a handful of dirt, and pronounced it rich, his companions required no further evidence. Unfortunately Finney was fit for little else than a divining rod, as he only remained sober when he was too poor to buy whisky and would never work longer than was necessary to obtain the means of filling his bottle.

It chanced, however, on the 22d of February, 1858, that while rambling over the hills north of Gold Cañon he fancied the appearance of a ledge of rock on the northeastern slope of the highest mountain of the range, called the Sun Peak by the miners, and determined to claim it as his property. Climbing up the rocks, he hid in a natural crevice a slip of paper on which was written, in pencil, a brief notice of location, and covered the deposit with a fragment of quartz. He never attempted to develop his claim as required by the district laws, but from that day forth his possessory title was recognized by the miners.[4]

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[1] Nevada Directory, 1861.

[2] Nevada Directory, 1861. William Wright, Editor Virginia City Territorial Enterprise, 1880.

[3] Mrs. L. M. Dettenrieder.

[4] Isaac E. James, Superintendent Sierra Nevada Mining Company, Virginia City, Nev., 1880.

The truth is that the regulations of the Columbia Quartz District were forgotten or only dimly remembered before a month had elapsed after their adoption. It was difficult for any meeting to frame rules which the body of miners would recognize as binding, for on one pretext or another compliance with any rule would be evaded or the existence even of a code ignored. If only a portion of the miners of the district were present at the meeting in January, the absentees might refuse to sanction the proceedings of this informal convention or to obey laws which they had no voice in framing; if the laws were adopted by a majority vote, the minority in the convention might decline to be governed by the decision. Even if the shifting population of the Johntown camp could be supposed to have adopted this code by unanimous consent, its constitution was fatally defective in the lack of provision for the enforcement of its articles. Public opinion or the sentiment of the majority might be opposed to an infraction of the code, but a mere expression of opinion was not a preventive. United action was often necessary, and this could not often be secured; for it was not in the nature of the easy-humored miner to insist upon a strict observance of rules, and except when his own interests were at stake he did not care whether another man obeyed the laws or broke them.

In spite, therefore, of Finney's neglect to develop his claim, as it was accounted of fanciful value merely, no one sought to dispute his rights on any pretext, and the ledge was christened the Virginia Lead in honor of its discoverer. The attention of the miners was drawn, however, to the hills above the cañon, as its paying sands were rapidly becoming exhausted.

In the winter of 1858–'59 Finney and three others, John Bishop, Alexander Henderson, and John Yount, set out from Johntown to prospect on the slope of the Sun Peak about a mile south of Finney's location on the Virginia Ledge.[1] Finney had noticed a large broad-topped mound on a previous excursion and proposed to make the first trial of the earth at this spot. The mound was covered with snow, but on shoveling this away a panful of dirt was taken out and washed by Bishop.[2] About fifteen cents worth of gold dust was left in the pan, a high average return, and Finney, in hunting over the mound, found a gopher hole around which was a heap of finely pulverized earth. The prospectors carried this heap to a neighboring ravine running into Gold Cañon, down which a small stream of water was flowing, and the yield of dust was still more satisfactory, whereupon the men staked out at once four rectangular claims, each 50 feet by 400, giving Finney, as the discoverer, the first choice.[1]

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[1] Virginia City Territorial Enterprise, October 7, 1863. C. C. Stevenson, Gold Hill, Nev., 1880.

[2] John Bishop, *vide* "The Big Bonanza," p. 42, by "Dan de Quille," William Wright.

A few days afterwards Henry Comstock and four others, James Rogers, Joseph Plato, Alexander Bowers, and William Knight, came to the newly-discovered diggings and took up a fifth claim of "50 feet frontage, running up the hill 400 feet," assigning 10 feet on the line to each man. Water was obtained by laying a flume of boards roughly nailed together from a point high up in the ravine, on the southern side of the Sun Peak, to the foot of the mound of earth, which the miners soon named Gold Hill. The only method used in extracting the gold was the simple one employed on the cañon placers. Work was not fairly begun until April (1859), when the dirt was shown to be comparatively rich.[2] The first hundred rocker washings yielded a little over $5, but, in the course of a day or two, mercury which had been brought from Johntown was used, and the result of a single man's work was $17. The average daily return to each miner was from $8 to $25, though on some claims the product was greater.[3]

While the miners at Gold Hill were slowly removing the dirt and crumbling rock from the surface of their claims, another party was steadily approaching the line of the lode from a different quarter.

In 1857, when the richest placer bars in Gold Cañon had already been worked for years and showed signs of exhaustion, the Johntown miners had been compelled to prospect in other ravines leading up from the valley much more thoroughly than they had previously done.[4] Beds of silt had been found in a cañon descending from the foot of the Sun Peak into the valley in a line running nearly east from the croppings of the

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[1] C. C. Stevenson, Gold Hill, Nev.

[2] "Early Times," Territorial Enterprise, June 20, 1875.

[3] Territorial Enterprise, April 28, 1859; Quoted by Sacramento Union, May 9, 1859.

[4] William Wright. "Big Bonanza," p. 31.

Virginia Ledge. The dust obtained from the rockers was lighter in color and less valuable than any previously washed out, but the placers were new and the return in quantity was sufficient to make up for the difference in quality. Besides, the miners were in the habit of buying a small amount of heavy California gold dust, mixing it with their own gold and selling this ingenious combination in Placerville, on the other side of the mountains, for $15 per ounce, until the cañon bullion became so poor that the trick could no longer be successfully performed.[1] Although deprived of this labor-saving invention the miners continued at work. The silt deposited in the cañon was a heavy, tough clay, which they were obliged to puddle before they could separate the earth from the gold in their rockers. The process of puddling consisted in stirring the clay briskly about in a large box or hole in the ground filled with water, by which means the mass was finally reduced to a thin pulp. Even working under this two-fold disadvantage the men were able to earn from $5 to $12 per day individually. As the brook flowing through the cañon narrowed to a thread in early summer the miners worked higher up the cañon, ascending steadily toward the source of the diminishing stream.[2]

Thus at the time when the Gold Hill placer was beginning to yield rich returns (May, 1859) the miners in the cañon to the north had moved up the ravine until two of their number, Patrick McLaughlin and Peter O'Riley, were washing dirt on the slope of the hill at its head. The earth was so poor that they were fast becoming discouraged and talked of setting out for the diggings on the Walker River, which were then thought to be promising well, but they worked on, hoping to earn enough to purchase the outfit necessary for their proposed venture, and made their trench each day farther up the hill.[3] A little rill of water flowed down the slope toward them, but so slender was the stream that, in order to use it for their rockers, they were obliged to dig a hole in the ground as a reservoir when they had crossed the narrow basin at the head of the cañon and reached the steep side of the Sun Peak.[4] Accordingly, on the 8th of June they began to dig this water-hole a short distance above the cut where they were mining.[1] The earth thrown out carelessly by their shovels was a yellowish sand mixed with bits of quartz and friable black rock, such as they had never seen before. Simply as an experiment they concluded to wash a little of the sand in their rocker, though they had slight hope that it would yield any return. From the trench sand they had been getting only a few specks of gold dust, but when the new earth had been shaken in the rocker and the muddy water had drained away they saw the bottom of the cradle covered with glittering dust.[2] Overjoyed at their good fortune they began to wash hastily the precious earth, and again and again swept up a golden layer.[3] The dust was of a pale yellow color, and the miners supposed that it was alloyed with some base metal, but it was unmistakably gold, and even with their rude cradle they were fast making a fortune.

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[1] William Naileigh, William Wright.

[2] William Wright, "Big Bonanza," p. 31.

[3] William Wright, "Big Bonanza," p. 47.

[4] Joseph Woodworth, San Francisco, December 1, 1879.

The line of the great lode had been cut once more, and a modern box of Pandora fairly opened. As usual, however, a loud-spoken trickster contrived to rob the true discoverers of whatever honor is due them. The names of John Orr, Hosea and Allen Grosh, James Finney, Peter O'Riley, and Patrick McLaughlin are almost unknown,—the Comstock lode is famous throughout the world.

How Henry Comstock won his monument and cut the name of an impostor ineffaceably in the rock is briefly told. He was a tall, gaunt Canadian, who had wandered about for many years as a fur-trader and trapper, and at length drifted to Gold Cañon, where he prospected with indifferent success, like most of the miners, until he took up a claim at Gold Hill, as has been noted, after the supposed placer had been marked out by the four discoverers. Always on the watch to avail himself of the exertions of others with as little fatigue to himself as possible, he quickly installed himself in the vacant cabin of the Grosh brothers and managed to hold his productive claim through the labor of two Indians only less lazy than himself.[4] Thus relieved from the irksome necessity of washing sand for a living, he was able to gratify his taste for rambling about aimlessly from point to point, and by chance came riding over the hills in the early evening of the day on which the discovery was made. The two Irishmen were preparing to leave the ground for the night and were cleaning up their rocker for the last time. They had marked in some way by stones or stakes the limits of their claim, and had no reason to suppose that their rights would be disputed. As he approached the water-hole his restless eye caught sight of the earth heap and the rich contents of the rocker. Without a word he sprang from his pony and threw himself on his knees in the hole, running his fingers through the dirt and observing the tiny spangles which clung to his hands. Standing up at length he coolly informed the astonished miners that they were trespassing on his land. A goat might search in vain for food among the crags and crumbling rocks of that barren peak, but Comstock pretended that he had taken up a tract of 160 acres along the slope of the mountain for a ranch, and that the conveniently indefinite boundaries of this tract included the water-hole and trench where the men were working. He was willing, however, to allow them to continue work, if they in turn would recognize his proprietary rights by conceding to his friend Emanuel Penrod and himself an equal share in their claim.[1]

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[1] James Corey, March 29, 1877; testimony under oath; S. C. Barnes *et al.* vs. California Mining Company.

[2] William Wright, "The Big Bonanza," p. 48. [3] Joseph Woodworth, San Francisco, Cal.

[4] Letter of H. T. P. Comstock; "The Big Bonanza," pp. 46, 84.

A more preposterous demand could scarcely be made. He had no title to the ground and no record of his ranche location. The land in question was the property of the United States, open by tacit consent for the occupation and use of any citizen. Yet he talked so loud and long that the miners for the sake of peace agreed to his proposal; but not content with this concession to his ridiculous pretensions, he laid claim further to the little stream which the men were using, asserting that it flowed from a spring higher up the hill, which Finney, Penrod, and himself had bought from the first discoverer and claimant. His title to the water was, perhaps, less absurd than his lien upon the land, and he succeeded, at any rate, in carrying his point by obtaining a grant of 100 feet on the line of the rich seam on condition that the right to use the water should be enjoyed by the partners in common. When this question was amicably settled, McLaughlin and O'Riley worked on quietly for two days longer, obtaining each day richer returns, while Comstock busied himself in prospecting on the new claim and in making preparation for the meeting which the miners proposed to hold on the 11th of June, near his claim on Gold Hill, in order to frame laws and regulations for a new mining district.[1]

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[1] William Wright, "Big Bonanza," p. 51.

In order to establish an undisputed title to their claim and obtain the unanimous passage of regulations enabling them to secure the extent of ground they desired, Comstock and his partners determined to conceal their good fortune. Accordingly, on the morning of the 10th of June they filled in the hole and removed, as far as possible, the traces of their recent work.[2] On the evening of the 11th of June the miners of the cañons assembled at Gold Hill and the meeting was formally opened.[3]

To clearly understand the foundation, character, and value of the laws adopted for the government of the proposed district, it is necessary to review the political condition of the county and to see what law-making powers, if any, were vested in this informal assembly. The years which succeeded the migration of the Mormon Valley settlers and the practical dissolution of the county organization were a troubled period, as might be supposed. How tavern "house-warmings" broke up in "free fights;"[4] how "cotillion parties" ended in war dances;[5] how the Wash-o Indians stampeded the horses of the settlers and transfixed two venturesome prospectors with arrows,[6] and how the whites held a summary court-martial and shot one of the adjudged culprits in the back as he made a bold dash through his guard after sentence was pronounced,[7] can only be mentioned in passing.

The climax was reached on a June morning in 1858, when a body of horsemen from a neighboring district rode through the valley of the Carson in a line stretching from side to side and caught in their net a gang of alleged cattle thieves and murderers.[8] Three judges presided over the trial and lynch-law justice was administered with all due form. One offender had previously been hung in Honey Lake Valley after a futile attempt to obtain the names of his accomplices by choking him with a noose,[1] and the court understood its duty. William Thorington, a hospitable, obliging, and social rogue, owning a station-house in the valley, was led out to execution singing the "Last Rose of Summer," and adjusted the rope about his own neck.[2] James Edwards was also hung, and three others fined or banished.

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[1] James Corey, Mar. 29, 1877; testimony under oath; S. C. Barnes *et al.* vs. The California Mining Company.

[2] James Corey.

[3] Gold Hill Records.

Sacramento Union, [4] August 26, 1857, [5] April 19, 1858, [6] September 8, 1857, [7] October 31, 1857.

[8] Sacramento Union, June 17, June 22, June 25, July 2, 1858; Territorial Enterprise, June 20, 1872; John S. Childs, Probate Judge, Genoa, Nev., 1880.

This exploit of the Vigilance Committee resulted in the formation of a Law and Order Party, composed of citizens who believed the trial a farce and that Thorington in particular was condemned unjustly. Through the representations of this party Governor Cummings, of Utah, appointed John S. Childs, of Genoa, to fill the office of probate judge in 1858,[3] and the legislative assembly of Utah were at length prevailed upon to reorganize Carson County—Act approved January 17, 1859.[4] The extraordinary judicial powers attached to the probate judgeship were so unprecedented that the appointee declined, with natural caution, to preside alone at the trial of important criminal cases.[5] As there was no jail in which to confine offenders, and the district court held most irregular and infrequent sessions, criminals went unpunished or received their deserts in a summary manner. So when John Herring blew off the top of E. H. Knott's head without apparent cause, a jury was impaneled "by the people" and the murderer tried "with all possible regard for the requisite formalities of the law."[6]

The civil and judicial condition of the district in the summer of 1859 is apparent without comment. The Gold Hill miners recognized their position in the following characteristic preamble, and the austere resolutions appended are curious reading in the light of subsequent events.

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[1] William Naileigh, eye-witness; Virginia City, Nev., 1880.

[2] William Naileigh, Virginia City, Nev.; John S. Childs, Genoa, Douglas County, Nev.

[3] John S. Childs, Probate Judge, Carson County, 1858.

[4] Acts and Resolutions, Legislative Assembly of Utah, 1859.

[5] John S. Childs.

[6] Sacramento Union, March 17, 1859; John S. Childs.

PREAMBLE.

Whereas, the isolated position we occupy, far from all legal tribunals, and cut off from those fountains of justice which every American citizen should enjoy, renders it necessary that we organize in body politic for our mutual protection against the lawless, and for meting out justice between man and man; therefore, we, citizens of Gold Hill, do hereby agree to adopt the following rules and laws for our government:

RULES AND REGULATIONS.

ARTICLE 4.

SECTION 1. Any person who shall wilfully and with malice aforethought take the life of any person shall, upon being duly convicted thereof, suffer the penalty of death by hanging.

SEC. 2. Any person who shall wilfully wound another shall, upon conviction thereof, suffer such penalty as the jury may determine.

SEC. 3. Any person found guilty of robbery or theft shall, upon conviction, be punished with stripes or banishment, as the jury may determine.

SEC. 4. Any person found guilty of assault and battery, or exhibiting deadly weapons, shall, upon conviction, be fined or banished, as the jury may determine.

SEC. 5. No banking games, under any consideration, shall be allowed in this district under the penalty of final banishment from the district.

The abhorrence of gambling, wrangling, and homicide, evident in these simple ordinances, would be creditable to an Arcadian community, and the moral standard of the legislators was consciously so high that it was judged sufficient to commit the easy task of enforcing the code to a single justice of the peace and the constable, his deputy.

It remains to inquire what laws, if any, existed governing the location and development of mining claims. German mining law, it has been said, was the product of antagonism, a compromise growing out of the struggle to maintain the right of free mining against the prerogatives of royalty. American prospectors had no such contest to pass through. At the date of the meeting at Gold Hill there were no laws to govern or restrictions to hamper their action except those regulations which each mining camp adopted for the security of the common interests of its members.[1]

Shortly after the admission of California into the Union in 1850 the question of the advisability of free mining was debated on the floor of the Senate by Fremont, Benton, Seward, and others, and the general feeling appeared to be in favor of unrestricted liberty, though it was expressed by no formal resolution. A bill introduced by Fremont, to establish a system of police regulations in the mining districts and imposing a small tax on the miners to defray the incident expenses, passed the Senate, but was lost in the House from want of time for its consideration. Before the next session the Californian miners had formed rules for their own government and protection, which rendered Fremont's bill unnecessary, and Congress took no further action in the matter.

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[1] Wallace's Reports, United States Supreme Court, Vol. III, Appendix No. 1, p. 100; William M. Stewart.

The Californian legislature, in 1851, after a careful investigation of the subject, declared that the rules and regulations of the different mining districts might be offered in evidence in all controversies respecting mining claims, and should govern the decision of the action when not in conflict with the constitution or laws of the State or of the United States. The territorial legislature of Utah had given the question no consideration, and the miners at Gold Hill, in 1859, believed themselves free to follow the example of the Californian mining towns and adopt any rules for their own government and for the development of the mining industries of the district which did not conflict with the constitution and laws of the United States or of the Territory. In reality, constitutional provisions and organic acts meant little or nothing to them, but they framed local regulations to suit their own ideas of equity, careless of possible flaws. Their civil or police regulations have already been given; the rules adopted governing the location and development of mining claims are as follows:

ARTICLE 1. There shall be elected one Justice of the Peace, one Constable, and one Recorder of this district for the term of six months.

ARTICLE 4. The duty of the Recorder shall be to keep in a well-bound book a record of all claims which may be presented for record, with the names of the parties locating or purchasing, the number of feet, where situated, and the date of location or purchase; also to return a certificate for such claim or claims.

SEC. 7. Evidence of record of claims shall be considered title in preference to claims that are not recorded; nor shall the recorder record more than one hill, dry gulch, or ravine claim in the name of an individual unless the same has been purchased.

SEC. 8. All claims shall be properly defined by a stake at each end of the claim, with the number of members forming said company and the number of feet owned.

SEC. 9. All claims shall be worked or the notice renewed in sixty days from the date of record, and no claim shall exceed 200 feet square, hill claims excepted, which may be reduced to 50 feet front.

SEC. 10. The Recorder shall be allowed the sum of twenty-five cents for recording the claim of each individual or member of a company.

SEC. 11. No Chinaman shall be allowed to hold a claim in this district.

SEC. 12. This district shall include all the territory from the meridian of Johntown to Steamboat Valley.

SEC. 13. All quartz claims shall not exceed 300 feet in length, including the depths and spurs.

SEC. 14. Any person or persons discovering a quartz vein shall be entitled to an extra claim on all veins he or they may discover.

SEC. 15. All persons holding quartz claims shall actually work to the amount of $15 to the share within ninety days from the time of locating.

SEC. 16. All persons holding quartz claims and complying with section 15 shall hold the same for the term of eighteen months as actual property.

SEC. 17. All quartz claims shall be duly recorded within thirty days from the time of locating.

SEC. 18. No person shall locate more than one claim on a vein discovered.

SEC. 19. Any and all persons locating for mining purposes shall have the same duly recorded within ten days from the time of locating.

SEC. 20. *Resolved*, That the above rules and regulations shall be signed by the citizens of this district and all who may locate hereafter.[1]

In accordance with these regulations a justice of the peace and constable were duly elected. The important office of recorder was filled by the appointment of the blacksmith of the camp, John A. Houseworth.

It is unnecessary to point out the evident ambiguities and flaws in this code. Under the most favorable conditions its execution would have given rise to incessant conflicts. Law making is, at best, a tentative process. A new law is always an uncertain experiment, and ordinances which have been approved a hundred times may fail at the next trial under altered conditions. The mining regulations of the Gold Hill District were not only framed by untrained hands, but their most important sections were fashioned under a grave misapprehension.

These provisions were derived in substance from similar codes in operation across the Sierras governing the division and development of narrow gold-quartz ledges dipping at well-defined angles in most instances. It was believed that the croppings on the slope of the Sun Peak were the exposed surfaces of similar ledges of gold-bearing quartz, and the idea that these waving, irregular, broken lines of rock were jutting points of one and the same lode never entered the minds of the venturesome lawmakers; but the Procrustean bed having once been made, it was certain that facts would be lopped off and strained to suit the original theory. It was easier to make the bed than to lie in it, but the radical error in its construction was discovered too late for correction.

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[1] Gold Hill Records.

Inapplicable, inadequate, and rudely framed as were the laws of the district, still they might have been fairly useful if their provisions had been enforced, but the easy-humored carelessness with which rule after rule was broken or totally ignored would be amusing if its consequences were not so vexatious. The laws were passed and signed by the citizens of the district who were able to write, but this action was apparently intended as a concession to some imagined necessity for a formal prelude to their foray upon the ledges—a sop, as it were, to an invisible dragon of legal fiction guarding the golden fleece. When by a semblance of law the treasure was placed in their hands they portioned it out without much regard for the restrictions imposed by their formal proclamation.

Abundant instances might be cited in support of this conclusion. Follow, for example, the record of the locations on the most famous half mile of the lode, used in evidence, because their history has been most accurately determined by repeated trials and decisions. Refer to the claims on the Comstock which have been acquired by the Ophir, Consolidated Virginia and California Mining Companies.

On the day after the adjournment of the meeting Comstock and his three partners placed a stake on the line of their croppings, about 50 feet south of the trench dug by McLaughlin and O'Riley, and a second stake 1,500 feet north of the first, following the direction of their ledge as nearly as possible.[1] So far, the proceedings were in accordance with the law granting 300 feet to each locator and an additional share for the discovery. Section 4 of these mining laws requires that a notice shall be posted on the boundary stake. There is no evidence that this was done, but with Comstock as herald it was probably superfluous. Section 19 requires that the notice of location should be duly recorded as the best evidence of title. This important regulation was not observed.

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[1] James A. Corey.

James A. Corey, a friend of Comstock, was permitted to inspect the black earth seam on the 9th of June, but was not allotted a share in the new claim as he had confidently expected.[1] He consoled himself for his disappointment by claiming a section 450 feet long on the ledge, just 150 feet more than he was entitled to by the Gold Hill code.[2] He measured his claim by pacing off what he supposed to be 450 feet, but, being naturally anxious not to underestimate the distance, he planted his boundary stake about 600 feet south of the first Comstock stake and posted on it a notice of his claim. Then he began prospecting near the north end of his claim, but after a day or two was interrupted by two miners, John Bishop and Horatio B. Camp, who notified him that the ground on which he was working belonged to them by virtue of a prior surface location.[3]

The sole evidence of this pretended location was their own assertion, but as it was a plain case of compromise or fight, Corey gave them a share of his ground. How much did he give them? From the record in the Gold Hill register[4] it would seem that each received 150 feet, but Corey afterwards swore that each received only an undivided one-third interest in the north 150 feet.[5] Bishop swore to the same effect in April, 1864, and received $400 for his expenses as witness, when Camp attempted to assert his right to the claim as recorded.[6] In 1872, however, Bishop forgot his oath taken eight years before, as well as a quit-claim deed which he had signed, and claimed a share of 150 feet, as Camp had done. These suits were lost; yet, by the provisions of section 7, the original claims would appear well grounded, as Corey did not see fit to record his own claim of 450 feet, or to protest against the record in the register. This trivial omission on his part and the clouded title thence resulting cost subsequent purchasers years of litigation and heavy expense. The southern 150 feet of the claim as paced off was not included in either location, but Camp and Bishop took possession of it informally and divided it up afterwards without dispute.

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[1] James Corey, March 29, 1877; testimony under oath; S. C. Barnes *et al.* *vs.* California Mining Company

[2] James A. Corey, March 29, 1877.

[3] John Bishop, March 23, 1877; S. C. Barnes *et al.* *vs.* California Mining Company.

[4] Gold Hill Records, Book A, No. 1, p. 3.

[5] James A. Corey, March 29, 1877.

[6] Thomas Sunderland, referee in case of Camp *vs.* California Mining Company, 1864; testimony under oath, April 2, 1877; Lucien Hermann, March 31, 1877; S. C. Barnes *et al.* *vs.* California Mining Company.

The ledge south of the stake planted by Corey was soon covered with a line of overlapping locations, made without any reference to the "well-bound record book." Joseph Webb wanted 50 feet of ground on account of a "hill claim" which he had located in the neighborhood before the discovery of the lode, as he said. Lee James and John Murphy posted the following notice, and took the unusual pains of recording it:[1]

NOTICE

That we the undersigned claim 600 feet of this Quartz Vein, Commencing at the South end of James Cory claim and running South 600 feet and two claims.

LEE JAMES.
JNO. MURPHY.

Recorded June 22, '59.

V. A. HOUSEWORTH *Recorder.*

John D. Winters followed suit with his notice:[2]

NOTICE

That I the undersigned claim-claim one claim on this Quartz Veim of 300 feet, commencing with the south end of Lee James & Co. and running south 300 feet to the line and one claim.

JNO. D. WINTERS.

Recorded June 22, '59.

V. A. HOUSEWORTH *Recorder.*

Prior to these three notices, however, Alexander G. White, Joseph M. Kirby, and A. G. Hammack had acquired 100 feet of the ledge, as they declared, by a location made on the 15th of the preceding month, attested as follows:

NOTICE[3]

That we the undersign do claim 100 feet wide running up the hill 400 feet including quartz and surface from notice near a ceder stump May 15, 1859.

This claim lies south of Penrod and Comsock claim Six-mile Cañon.

A. WHITE.
JOS. CURBY.
A. G. HAMACK.

Recorded June 27, '59.

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[1] Gold Hill Records, Book A, p. 4.

[2] Gold Hill Records, Book A, p. 4.

[3] Gold Hill Records, Book A, Vol. 1, p. 14.

The futility of the formal code of mining laws adopted June 11th is sufficiently apparent from the single fact that this vague hill-claim notice, in all probability manufactured and ante-dated to suit the occasion, was regarded as establishing the claim of White, Kirby, and Hammack to a section of the newly-discovered lode.

Four prospectors, called collectively Sides & Co., took 500 feet on the line of the supposed lode or lodes next to the claim of Winters,[1] calling attention by a notice to the fact—

> That we, the undersigned, do claim 500 feet commencing at J. B. Winters' claim Running South Including surface and Quartz with all of it Dipps and angles sprs
>
> F. B. ABERNATHIE.
> P. M. BALDWIN.
> E. BELCHER.
> R. D. SIDES.
>
> Recorded June 23, 1859.
> V. A. HOUSEWORTH, *Recorder*.

But when the claimants came to take possession it was found that while nature had made only 710 feet of ground between the Corey south stake and a well-recognized location made by Alva Gould, James Buchanan, and Abe Field, June 23, 1859, yet they had taken up 1,550 feet, nearly twice as much as actually existed.[2] Accordingly, in the early part of July there was a mustering of owners and a compromise, by which the ground was measured off by means of a rope with an accuracy which satisfied the disputants. Joseph Webb was granted 50 feet measured north from the Corey stake, apparently by consent of Corey, Camp, and Bishop. Lee James and John Murphy received 110 feet lying next south. Next to this claim a section of 100 feet was assigned to White, Hammack, and Kirby, while John D. Winters and the "Sides Company" were allowed to take possession of the remaining 500 feet.[3] Webb never recorded his "hill claim" or his assigned portion of the ledge, which neglect on his part was the main cause of a most costly lawsuit. The records of the other claimants have been given, but as their subsequent agreement was simply a parol one, accompanied by delivery of possession, the title of assignees was contested in the courts even up to the present year, 1881.

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[1] Gold Hill Records, Book A, p. 6.

[2] Gold Hill Records, Book A, p. 16.

[3] Alexander G. White, testimony under oath; Joseph M. Kirby, testimony under oath; George W. Kinney *et al.* *vs.* The Consolidated Virginia Mining Company *et al.*

This is only one of a thousand instances which might be cited to show the characteristic negligence of the prospectors or their wilful disregard for their own laws and regulations. Some allowance may be made for their ignorance and for an easy-natured carelessness inbred by their roving and reckless habits of life, but there can be no doubt that pretended thoughtlessness was often a mask for fraud and greediness.

If a locator found rich croppings or a promising ledge, he was not anxious to define his boundary lines by stakes until he had satisfied himself of the extent and probable dip of his ore body, for if he placed his terminal stakes before he had traced the line of his ledge and explored his seam of ore, he might inadvertently cut short his own bonanza. So he was in no hurry to mark his section, and his neighbors were equally tardy. Notice after notice would be posted claiming the allotted number of feet on a ledge, but never defining the precise position of the locations, as every man naturally wished to cut off the richest slice of the prospective bonanza and was not disposed to cut the loaf until he knew its contents. If his neighbor found ore and he did not, he was thus prepared to plant his boundary stakes in that neighbor's ground, and by hook or crook obtain a share of the treasure. This humanly covetous spirit might, to be sure, overreach itself. The bonanza might be in his own ground and not in his neighbor's, when he might expect to see hungry claimants swooping down on his undefined plot of ground like a swarm of vultures; still by his estimate of chances he was ready to take this risk, relying on his own quickness to secure the first grasp of the prize and on the shotguns of his friends to insure its enjoyment.

If he was reluctant to post stakes therefore, as required by the laws, he was still more unwilling to limit his chances further by recording a notice defining his boundaries. Stakes could be pulled up and thrown away, but records were not so easily got rid of. A certificate of location filed by himself might prove a disagreeable witness hereafter, and he was in no haste to forge weapons which could be used against himself. So his monuments or boundary stakes, if fixed at all, were light pine posts (4 by 4 inches usually),[1] and his notices, if recorded at all, were still more flimsy in character.

The prospectors in the Washoe district acted simply as prospectors do now and have done, as a class, from time immemorial. They were neither better nor worse than others. "I have always been struck," wrote Don Joseph Saenz, "with the objection which miners seem to have against getting their mines measured out until they are required to do so by neighboring proprietors,"[2] and Gamboa, after setting forth most earnestly the necessity of scrupulously determining and guarding the boundaries of mines,[3] adds: "Practice, however, in mining districts will be found to be much the reverse of this, for either from sloth and idleness or from covetous and improper motives, the measuring out of the boundaries of mines is neglected, with the connivance of those whose duty it is to scrutinize into and punish the omission, until the discovery of some great bonanza or the occurrence of a communication between different mines arouses the feeling of self-interest, and litigation and contention as to the boundaries are the consequences, which would have been prevented had the alternative so properly directed by the crown ordinance (XXVI) of measuring out the mines and setting up regular landmarks at once been adopted."

In regard to registration of notices of discovery and location, the same writer is if possible more emphatic.[4]

By the royal ordinance XVII a discoverer must register his mine within twenty days after discovering or finding the ore before the mining justice of the district, and must produce the ore which he has found. The register must describe the person registering and the place where the ore is situate. Within sixty days a person making registry must send such authenticated copy to the administrator general or to the administrator of the department in which the mine is located, and if such registry is not made in the manner described, any person may register such mine and thereby have and acquire all the rights of the discoverer. In the notice of registry all mines must have some determinate limits or boundaries assigned to them,[1] and all sales, contracts, and other documents of title must be made to appear in the registry book or archive,[2] in which not only purchase deeds, but all alterations of boundaries must be entered.[3] Every province shall have a mining notary and deputies. The chief must reside in the principal mining district, and all registries must be ratified before him within sixty days.[4] Even the very hour of making the registration should be noted,[5] and no pretense of being impeded by distance, illness, or the like should be admitted by way of excuse for not making registry,[6] as such obstacles can always be overcome by diligence, and a servant or deputy might, at any rate, be sent with the ore if the locator was really unable to go himself.

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[1] Testimony of I. E. James, surveyor of Comstock Ledge in August, 1860. G. W. Kinney *et al.* *vs.* Consolidated Virginia Mining Company, 1877.

[2] Tratado de las medidas de minas, chap. 6, n. 13.

[3] Gamboa's Commentaries, Heathfield's Translation, vol. 1, p. 326.

[4] Gamboa's Commentaries, vol. 1, p. 139, Ordinance XVII.

The ordinances of Peru allowed thirty days in which to make the registry under penalty of forfeiture for non-compliance with the requisition. Only two exceptions to this rule were noted: (1) when a person was prevented by hostile force from making such registry, the situation of the mine being at the same time very remote from the place of registration; (2) when the locators were Indians, allowance being made for the natural ignorance of these people.[7]

If these explicit injunctions and ordinances were necessary in regulating mine locations in districts where the chances of confusion and disputes were slight compared with those certain to arise at the Washoe mines, how much more essential was it that the mining laws of the Gold Hill district should be carefully drawn and rigidly enforced. In Mexico and Peru rectangular locations were alone permitted, and the miner was confined within planes drawn perpendicularly to his surface boundary lines, but in the Gold Hill district each locator held a section of a ledge with all its uncounted "depths and spurs," and enjoyed the right of following its course wherever it extended and the certainty that he would come into collision with his neighbors on one side of his line or the other.

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[1] Heathfield's Translation, Gamboa's Commentaries, vol. 1, p. 143.

[2] Ibid., p. 147.

[3] Ibid., p. 147.

[4] Ibid., p. 147.

[5] Ibid., p. 148.

[6] Ibid., p. 150.

[7] Ibid., p. 150.

Moreover, the so-called Comstock ledge had the unfortunate peculiarity of first inclining to the west and then back toward the east, so that the chances of collision were doubled.

Small wonder was it, therefore, that when Ross Browne arrived in the district during the summer of 1860 he found the ledge, as he expressed it humorously, "in a mess of confusion."[1] Its share-holders had the most enlarged views of its dips, spurs, and angles, but those who struck croppings above or below were equally liberal in their notions. "Everybody's spurs were running into everybody else's angles. The Cedar Hill Company was spurring the Miller Company; the Virginia Ledge was spurring the Continuation; the Dow Company was spurring the Billy Chollar, etc. It was a free fight all round."

In Mexico and Peru also, the allowance of a specified number of varas for the length of a claim could not be misinterpreted. In the Gold Hill Mining District a locator was allowed "300 feet in length," and he was really at a loss to know whether this article gave him the ledge with all its turns and twists within given boundaries 300 feet apart in a straight line, or whether he was obliged to lay out his 300 feet on the curving line of the ledge-croppings. Of course, in the surveys of mine claims made by James E. Freeman, I. E. James and others, for various mining companies, a base-line was determined which was cut by side or end-lines at right angles, but these determinations were of later date than the early locations, when many of the prospectors traced up, as well as they could, the supposed winding courses of their ledges by isolated croppings, measuring their allotted number of feet by a rope from point to point or by pacing off the distance.[2] This practice, coupled with the neglect to stake off their claims properly, produced such collisions as were noted in the locations of Webb, Murphy, White, Winters, and Sides, before cited.

Again, in Mexico and Peru the registrars were State officers of presumed competence, who kept carefully the records intrusted to them and filed authenticated copies with the administrator general.[3] In the Gold

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[1] J. Ross Browne, "A Peep at Washoe."

[2] George R. Wells, San Francisco, Cal., trustee Consolidated Virginia Mining Company, 1878, who had occasion to make careful investigation of the methods adopted by the early locators.

[3] Ordinance XVII.

Hill Mining District, where the early locations on the line of the Comstock ledge were made, the recorder was an uneducated blacksmith and the transcripts of notices decidedly untrustworthy.

The book which is handed down to the present time as containing copies of original notices of location made by Houseworth deserves preservation as a relic of mining customs twenty years ago, but it is surprising that it should ever be cited as an authoritative record. Even if it contains the earliest transcripts, which is at least questionable—for it was currently reported in 1860 that the first records were made on loose sheets of paper, of which some were lost and some destroyed[1]—yet it shows such marks of carelessness, erasures, irregular additions, and it is scarcely unwarrantable to add, positive fraud, that its legal value is materially diminished.

The first record of ledge location in the book, for instance, is that of the Sierra Nevada Mining Company, so called, on the 22d of June, 1859.[2] The tattered and dirty page of the record book has been repaired and preserved with unusual care. Attested copies have been taken of this notice of location, and a *fac simile* by the photographic process has even been obtained; yet the record as it stands is hardly worth preserving, for it has unquestionably been antedated at the outset and mischievously tampered with afterward. Walsh, Woodworth, and others whose names are mentioned did not arrive on the ground until the 1st of July, 1859,[3] and the location in question was not made until the following day (July 2, 1859).[4] The entries which follow for several pages on the record-book were evidently made by the same recorder and are signed V. A. Houseworth, but if Houseworth recorded these notices he certainly did not record others on subsequent pages which appear over the same signature. The book was kept by the recorder in a saloon, where it lay on a shelf behind the bar, and was taken up by any one who wished to alter the course of his boundary lines or make such insertions as might please him. When the book was not wanted for this use the miners lounging about the saloon were in the habit of using it as a harmless club in the excess of their good fellowship.[1]

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[1] William M. Stewart, first Senator from Nevada, and many others.

[2] G. H. R., Book A, p. 1.

[3] Joseph Woodworth, December 1, 1879.

[4] Joseph Woodworth, December 1, 1879; James Walsh, March 31, 1877; sworn testimony, S. C. Barnes *et al.* *vs.* California Mining Company; Nevada Journal, July 1, 1859: "Judge Walsh, of Grass Valley, left that town June 29 for the other side of the mountains."

It is certainly fortunate that parol agreements accompanied by delivery of possession have been recognized as a lawful mode of passing title,[2] for possession is far better evidence of title than such records as these.

While Corey and other prospectors were making locations on the line of the lode, the cut in the claim of McLaughlin and O'Riley was slowly opened. The prospectors noticed the bits of black rock which were mixed with the surface sand, but had no idea of their value and threw them away with the other screenings from their rocker sieve. At a depth of four feet from the surface a seam of this black rock was uncovered from one to three inches in width, but increasing in size as its downward course was traced.[3] It was a novel sight at first to the miners, but they soon became tired of speculating about it and looked upon it as a hindrance to their work.

As they dug their hole deeper a harder stratum of earth was cut which could not be washed to advantage in rockers.[4] They had crushed the clotted masses with picks and sledge hammers, but the work was too laborious and they determined to procure an arrastra. Accordingly, on June 24, Joseph A. Osborn and John D. Winters, jr., were given a two-sixth undivided interest in 1,400 feet of the Comstock claim in consideration for the supply of two arrastras and two horses or mules for the use of Comstock and his partners.[5] The remaining 100 feet of the claim as originally located was assigned to Comstock and Penrod, as had been agreed upon, and was measured off from a point 200 feet north of the south boundary stake of the claim.

With the aid of these arrastras the partners began to make large profits, though as yet they had neglected the black rock wedge in the centre of their claim as worthless to them. A few sample pieces of this seam were carried to Placerville, Cal., however, by curious visitors, and a ranchman of Truckee River Meadows, B. A. Harrison, gave a fragment of the rock to Melville Atwood, a skillful assayer, for test June 27, 1859. The result of his assay showed a value per ton of $3,000 in silver and $876 in gold.[1] The surprising richness of this sample was made known to James Walsh and Joseph Woodworth of Grass Valley, Cal., who set out at once for the new district in company with the ranchman Harrison and J. F. Stone.[2] From the arrival of this party at Gold Hill, July 1, 1859, the development of the great silver deposits of the Comstock Lode may be said to date, for the yellowish sand was then ascertained to be a rich chloride of silver ore, and the black rock was found to be a well-defined vein of silver sulphurets.[3]

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[1] William Wright, "Big Bonanza," p. 62.

[2] Hon. Lorenzo Sawyer, Judge United States Circuit Court; George W. Kinney *et al.* vs. Consolidated Virginia Mining Company; 420 Mining Company vs. Bullion Mining Company.—(3 Sawyer, 658, 659.)

[3] James Walsh, San Francisco, March 22, 1881.

[4] William Wright, "Big Bonanza," p. 56.

[5] Gold Hill Records, Book A, p. 7.

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[1] Sworn statements of B. A. Harrison, (February 3, 1870), and Melville Atwood, (February 1, 1861), in possession of Almarin B. Paul, San Francisco, Cal.

[2] James Walsh, Joseph Woodworth; Nevada Journal, July 1, 1859; Sacramento Union, July 2, 1859.

[3] James Walsh.

CHAPTER IV.

THE MINING CAMP.

The surface of the lode had been barely scratched at Gold Hill and on the northern claims, but a ledge of silver ore had been uncovered beyond question. The early prospectors had done their part by ignorantly revealing the existence of this vein. Men of a different stamp were needed to take up the work at this point and carry it on to a successful completion.

Examine the true proportions of the work undertaken in 1859. The task presented to capital and labor was the development of a silver lode cropping out on the slope of a barren mountain more than a mile above the level of the sea.[1] North, east, and south the mountain was surrounded by deserts. West lay the white capped range of the Sierras, a barrier penetrable only through a few steep passes blocked with snow during the winter months, which led over its summit and down the western slope to the young cities of California.

The range, in the heart of which the lode was placed, was a lumpish ridge of discolored rocks and earth, partly covered but not concealed by underbrush and scrawny cedars. During the dry season no water flowed down into its ravines, and in the spring only meager brooks ran through the main cañons. On its parched and rocky slopes no vegetation could flourish except the indomitable sage-brush "that covers the desert like a coat of hair."[2]

If a city was to be built on the line of the lode, it must be a foreign creation. Water must be made to flow from the rocks or conducted from distant lakes; roads must be cut and blasted through the cañons and along the edge of mountain precipices; the frame-work of the houses and the timber used in the mines must be cut from the trees of the Sierras and dragged up to the mountain camp; food, clothing, tools, and supplies of all kinds must be transported by slow and costly methods from the Pacific sea-board.

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[1] Ledge croppings about 6,400 feet above sea-level.

[2] "The Arizonian," Joaquin Miller.

The Spanish proverb, quoted by the peon miners in 1850, is not complete. Not only a gold mine was requisite to work a mine of silver such as this, but energy incessant and untiring, faith which no discouragements could shake, and skill born of years of varied experience. California furnished the men, the methods, and the means.

Prospectors began to flock to the new camp as soon as the news of the discovery of silver was announced,[1] but the great majority of them knew nothing of the characteristics of silver ledges, and croppings of barren rock of any description were equally as valuable to their ignorant eyes. The slopes of the Sun Peak and the contiguous hills were soon covered with stakes and rudely scrawled notices of location, and later the mountain district for miles around was claimed by a constantly increasing and never-satisfied swarm. When the croppings were taken up, pits were sunk a few feet in the ground, and as soon as the bed-rock of the mountains was reached "blind ledges," so-called, would be located and held without an attempt often to prospect further.[2]

The little Johntown colony was soon merged in this stream of fortune hunters. Rough-haired mustangs, gaunt mules, and sure-footed little "burros" climbed the Sierras loaded with stacks of blankets, bacon, flour, kettles, pans, picks, shovels, and other articles of a miner's outfit. The ravines and brown hillsides were dotted with a restless swarm. Thin wreathes of smoke rose from hundreds of little camp-fires on the hills, and the sharp strokes of falling picks startled the lizards from their hiding places in the rocks.

Little work except prospecting was done during the summer and fall of 1859, but the Gold Hill claims taken up by Finney and his companions in January were steadily opened up and their product constantly increased,

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[1] San Juan Press, July, 1859; Sacramento Union, July 26, 1859; Marysville Democrat, July 26, 1859; Sacramento Union, July 28, 1859.

[2] Sacramento Union, September 13, 1859.

The only other productive claims of importance were those located by by Comstock and his partners on the eastern slope of the Sun Peak, and the claim of Corey lying next their boundary on the south.[1]

Comstock was so grasping in his methods of acquisition that it was natural to suppose that he would show equal selfishness in managing his claim and hoarding his gains. On the contrary, after attaining his point he seemed to care little about making the most of his good fortune.[2] He preferred to talk by the hour to any listener of the richness and extent of the mineral deposits in the range and the future greatness of the city which he foresaw would be built up in the mountains. Visionary and thriftless, he at once magnified and belittled his own possessions. Although proclaiming in boastful vagaries the value of his pretended discovery, he was actually persuaded to make over his interest in the new ledge to Herman Camp, a shrewd speculator, without any tangible consideration.[3] The deed of transfer was formally drawn and signed, but Comstock was so unmercifully laughed at when his action was known that he repented and bethought himself how he might get his mine back again. His method was a simple one. Camp was induced to allow a jury of miners to sit in judgment upon the validity of his deed from Comstock. This jury was composed of Comstock's friends and companions, who had indistinct notions of proceedings in equity, but a clearly defined dislike to the newcomers from California who were fast taking the control of the district out of their hands. Consequently, after a short deliberation they decided to tear up the deed, which was done with all due gravity, in spite of the protest of the luckless assignee.

Comstock did not long keep possession of the claim so easily regained. Mr. James Walsh, one of the party which came to the mines from Grass Valley in July, had been quietly testing the silver ore of the ledge and had satisfied himself fully of its remarkable richness.[4] He obtained permission from Comstock and his partners to send a sample sack of the black sulphuret ore to Joseph Mosheimer,[1] a leading assayer in San Francisco, and later two larger consignments of 500 and 3,500 pounds. Meanwhile he obtained a bill of sale of Comstock's interest in the 1,400 feet of the united claims, as well as other titles of less value, for the sum of $10 in hand paid and the agreement to pay the further sum of $10,990 at a later date, in accordance with the provisions of a private agreement.[2]

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[1] Sacramento Union, October 25, 1859; La Porte Mountain Messenger, October 22, 1859.

[2] Joseph Woodworth, William Wright, Henry de Groot.

[3] Henry de Groot, San Francisco, California; Comstock Papers, No. 8; Mining and Scientific Press, November 4, 1876.

[4] James Walsh; Joseph Woodworth.

The bargain was more profitable to Comstock than his former one with Camp, but the terms were decidedly favorable to Mr. Walsh, as he had an opportunity to cancel the agreement at trifling loss to himself if the product of the ore taken from the claim did not equal his expectations. The sale was completed, however, and additional interests were bought up as well by Walsh and other speculators, so that before the spring of the following year (1860) none of the original holders of the first location on the Comstock ledge, except John D. Winters, retained their shares. Five-sixths of this location, or 1,166 feet, were sold for $70,601, or at the rate of about $60 per foot.[3] The purchasers and subsequent assignees, in order to develop their claims, united with John D. Winters in an informal association, which was organized under a corporation charter in April, 1860, as the Ophir Gold and Silver Mining Company.

With the disposal of their claims Comstock and his partners fell out of their chance position of prominence and took no further part in shaping the history of the lode. The little fortunes which they acquired by the sale of their claims were wasted rapidly in most instances, and they drifted back into the congenial pursuit of prospecting for ledges and placers, passing so completely out of sight that the manner of their after lives and deaths could only be learned by extended inquiry, the result of which is briefly outlined in another connection.

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[1] J. Mosheimer.

[2] Virginia Mining Records, Book A, pp. 75, 76. Deed signed August 12, 1859.

[3] Virginia Mining Records, Book A, pp. 1, 77, 128, 253, 337; Book B, p. 100; Book C, p. 100; Book D, p. 257. Gold Hill Mining Records, Book A, pp. 5, 20; Book B, p. 64. J. A. Osborn was the partner, so-called, of V. A. Houseworth, and assigned to him "for value received" (Gold Hill Records, Book A, p. 10) one-half of his interest or one-twelfth of 1,400 feet on the ledge. Houseworth assigned one-twenty-fourth of 1,400 feet to B. F. Settle (G. H. R., Book A, p. 5) "for $1 in hand paid." Strictly speaking, therefore, nineteen-twenty-fourths of 1,400 feet were sold for $70,600, and one-twenty-fourth later, together with one-tenth of 1,500 feet known as the Crown Point Ledge, was sold for $3,000.—(Deed of Settle to Winters; Gold Hill Records, Book A, p. 20.)

Corey, Bishop, and the other early locators, with few exceptions, followed the example of Comstock.[1] The sums which they received for their claims were not large, varying from a few hundred to a few thousand dollars, but to prospectors living from hand to mouth the bargains were satisfactory, as they assured a brief season at least of idleness and pleasure; besides, the actual worth of their claims was undetermined. They knew nothing of underground mining or of the methods of reduction of silver ores, and were too poor or too impatient to undertake any systematic course of exploration. Their surface working, as a rule, disclosed nothing of value, and if they were on the line of a silver lode there was as yet no knowledge of its continuance in depth or of the distribution of its ore bodies. Weighing the chances of gain and loss as they stood in 1859, the prospectors had no cause to reproach themselves for lack of foresight. The Californian speculators were venturesome and liberal enough in their offers, buying in the dark as most of them did, and more than one was ridiculed at first by his friends in San Francisco for his absurd investments. John O. Earl, for instance, buying O'Riley's interest for $40,000, after a careful examination and test of the ore in a claim of proved value, was regarded as a wild enthusiast,[2] and Alva Gould, who sold a claim on the line of the same croppings for $450,[3] was not laughed at as he rode down Gold Cañon at night, shouting with drunken self-complacency, "Oh, I've fooled the Californian!"[4]

At the close of the year 1859 the hill-inclosed basin at the foot of the Sun Peak presented a curious picture. The ground was torn up in all directions with shallow cuts and pits; diminutive adits pierced the hillsides like the holes of sand swallows in a mound, and the gray carpet of sage-brush was buried under unsightly heaps of sand and crumbling rocks.

This ignorant expenditure of energy had accomplished little or nothing. The reserved claim of Comstock and Penrod and the northern portion of the Corey claim were the only plots of ground shown to be valuable in addition to the Gold Hill tract, 250 feet in length, and the southern 200 feet of the Ophir claim.[1] An organization, self-styled the Central Company No. 1, held possession by purchase of the northern 150 feet of the Corey claim,[2] and the 100 feet reserved by Comstock and Penrod had been transferred, on payment of $9,500,[3] to Gabriel Maldonado and Francis J. Hughes, who constituted what was called the Mexican Company.

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[1] Comstock Papers, Nos. 9–14; Mining and Scientific Press, November 25, December 2, 9, 16, 23, 30, 1876.

[2] John O. Earl, San Francisco, Cal., 1880.

[3] Deed of Gould to Black, Virginia Mining Records, Book A, p. 86.

[4] Henry de Groot, San Francisco, Cal.

The seam of black sulphurets of silver running through the claims of the Central and Ophir companies had been rudely developed by digging large pits following its course downward,[4] and the rich ore as well as its metalliferous casing of reddish-white quartz had been cut out with picks and raised to the surface. The quartz body was a broken, seamy ledge, 20 feet in width,[5] inclosing a vein of sulphurets from 4 to 15 inches wide at the level reached by the pits on the 1st day of November, 1859, 30 feet from the surface. The course of the vein was a little west of magnetic north, and it ran downward with the dip of the ledge at an angle of 48° west, increasing in width as the stringers of ore gradually united in a well-defined and compact seam.[6]

The Ophir Company employed ten miners at wages of from $3 to $4 per day, and had sunk two inclined shafts by the 1st of November to the 30-foot level, opening up the ledge at this point by a large excavation.[7] The Central Company had an equal number of workmen employed, and the bottom of their shaft had reached the same level. Fifty-five tons of sulphurets had been taken out by the two companies, and about 1,000 tons of mineralized quartz. The sulphuret ore was broken up in small pieces and transported in boxes and sacks, on the backs of mules, across the Sierras.[8]

The first consignment of ore from the mines was carried to San Francisco by James Walsh and Henry Comstock, who arrived on the 30th of August, 1859. They sold their freight, 3,151 pounds in all, for $1.50 per pound without difficulty.[1] This success induced the owners of the "Ophir claim" to ship their rich sulphuret ore to San Francisco as rapidly as it could be extracted, and before the 1st of November, 1859, at which date the freighting season was practically closed, 38 tons had been sent away and delivered to Joseph Mosheimer, of San Francisco, for reduction.[2] The gross yield of this ore when crushed and smelted was $112,000, so that the profits of the Ophir Company were very large, although the expenses of reduction were $412 per ton and the freightage charges for transportation to San Francisco were $140 per ton.[3]

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[1] Sacramento Union, October 28, November 4, 1859; Special Correspondent, "Ophir Diggings," October 22, October 30, 1859.

[2] Virginia Mining Records, Book A, pp. 42, 57. Gold Hill Mining Records, Book A, p. 45.

[3] Virginia Mining Records, Book A, p. 128, Book C, p. 100.

[4] Sacramento Union, September 13, 1859.

[5] Sacramento Union, October 25, 1859.

[6] Philip Deidesheimer, Superintendent Hale and Norcross S. M. Company, Virginia City, Nev.

[7] Sacramento Union, November 9, 1859; Special Correspondent, October 31, 1859.

[8] John O. Earl, San Francisco, Cal.; Sacramento Union, November 4, 1859.

The books of J. R. Whitney, consignee's agent at Sacramento, showed that 41,400 pounds of ore were shipped to San Francisco by the Central Company during the season of 1859, and though no record of its value is now attainable, it may safely be assumed that the gross yield was fully $50,000.[4]

No systematic work was undertaken by any other companies during 1859 except by the Mexican company, which by the end of October had just reached the black sulphuret vein. Still the metalliferous quartz of their ledge, when crushed in arrastras, yielded a fair return, as did also the mound claims at Gold Hill, though worked rather indolently in most instances.

The following table, compiled from various sources, furnishes probably the best approximate record attainable of the bullion yield during 1859 and the previous year:

GOLD CAÑON CLAIMS.

YEAR.	Number of working days.	Number of miners.	Daily earnings.	Total.
1858	120 × 220 ×	[5]60 × 20 ×	[5]$3 = 3 =	$21,600 13,200
				$34,800

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[1] James Walsh, March 22, 1881.

[2] James Walsh; Joseph Mosheimer.

[3] John O. Earl, San Francisco, Cal.

[4] Sacramento Union, November 4, 1859; report from books of J. R. Whitney, consignee's agent, Sacramento, Cal.

[5] Sacramento Union, March 13, 1858; William Nalleigh, Virginia City, Nev., 1880.

GOLD CAÑON CLAIMS.

YEAR.	Number of working days.	Number of miners.	Daily earnings.	Total.
1859	120 ×	40 ×	$5 =	$24,000[1]
CARSON RIVER PLACER.				
1859	280 ×	50 ×[a]	$2.50 =	$35,000
				$59,000
a (Chinese miners chiefly.)				
COMSTOCK LODE.				
Ophir mine, ore smelted			$112,000[4]	
Ophir mine, ore reduced in arrastras			18,000[3]	
Central mine, ore smelted			50,000[4]	
Central mine, ore reduced in arrastras			12,000[5]	
Mexican mine, ore reduced in arrastras			15,000[5]	
Gold Hill claims, arrastras and rockers			50,000[6] =	$257,000
				$316,000

On the 2d of November, 1859, a storm came up from the west, burying the hills a foot deep in snow.[7] The winter had set in early and work on the claims was generally abandoned. Some of the miners found quarters in the valley towns, but the main body remained near their claims at the foot of the Sun Peak, which had received the more prosaic name of Mount Davidson, in honor of a San Francisco banker, one of the incorporators of the Ophir Company, to whom the shipments of sulphuret ore were consigned.

Two little towns had sprung up on this ground, one at Gold Hill taking the name of that mound,[8] and the other about the Ophir claim named Virginia City,[9] after the first locator of the Virginia ledge and the Gold Hill mound claims, "Old Virginny." A single street had been laid out in October, 1859, by Herman Camp and Henry de Groot, along the supposed line of the Comstock ledge, running therefore nearly north and south, except when it was necessary to make a detour to avoid cabins whose owners refused to move.[1] On the line of this street two houses of roughly cemented stone had been built, surrounded by straggling lines of flimsy huts.[2] Tents of dirty, ragged canvas pieced out with tattered clothes coated with grime—hovels of pine boards roughly nailed together and pierced by bent and rusty stove-pipes—heaps of broken rocks with shapeless crevices into which men crawled like lizards—shallow pits partly covered over with boards and earth—and embryo adits, dark slimy holes into which the melting snow dripped with a monotonous plash—these were the winter homes of the citizens.

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[1] Sacramento Union, October 28, 1859; Special Correspondent, Ophir Diggings, October 22, 1859.

[2] J. Mosheimer. [3] Sacramento Union, November 9, 1859. [4] Report of J. Whitney, consignee's agent.

[5] Sacramento Union, November 9, 1859; Special Correspondent, Washoe District, October 31, 1859.

[6] La Porte Mountain Messenger, October 22, 1859.

[7] Henry de Groot, San Francisco, Cal., 1880; Census Marshal for Western Utah, 1860.

[8] Named February 8, 1859.—(Territorial Enterprise, June 20, 1875.)

[9] Named at meeting in September, 1859. James Walsh; testimony under oath; S. C. Barnes *et al.* vs. Consolidated Virginia Mining Company.

Fierce whirlwinds, which the shivering miners with invincible humor christened Washoe zephyrs, swept down the sides of Mount Davidson with blinding gusts of snow, unroofing the huts and tossing the mangled tents over the rocks. The miners swore at the snow and the wind and the market prices, but had no thought of abandoning their camp. When they had no wood they cut the dry sage-brush and managed to cook their daily bacon over the light crackling fires. If the snow drifted through the chinks of their huts and covered them with an icy powder, they rolled their blankets more tightly about their bodies and closed their ears to the blasts which howled above their heads. The sacred thirst for gold had made them insensible to cold, hunger, and fatigue, and they longed for the coming of spring, therefore, not so much as a relief from the sufferings of the winter as because they could begin again their untiring search for hidden veins of ore. Meanwhile they passed the tedious days in gambling, drinking, and discussing the prospects of the next season.

On the other side of the Sierras, in cheerful homes of San Francisco, men waited for the spring-time with scarcely less ardent impatience. The mountain barrier was still covered with snow when that extraordinary movement, called tersely the "Rush to Washoe," had already begun. "Rushes" to different mining districts were common, but since the mighty migration by land and sea toward California in 1849 there had been no excitement equal to this.

The discovery of gold was already a twice-told tale; the discovery of silver was a novel sensation. The bars of white bullion from the furnaces of Mosheimer were followed by a gathering crowd as they were borne through the streets of San Francisco, and a throng of excited spectators stood all day before the windows of the bankers, Alsop & Co., in which they were displayed.[1] To some the silver was merely a novel product of neighboring mines; to others the bars were pregnant with dazzling images. The treasures of Potosi, the ransom of Montezuma, the deep-laden galleons of Spain, and a host of vague memories were awakened by the sight of these masses of bullion. The fever spread rapidly; merchants closed their counting-rooms and clerks left their desks; sailors deserted their ships and mechanics their work-shops; the ranchmen from the plains and the restless swarm of gold-placer miners swelled a migration not unlike the train of children drawn on by the entrancing notes of the piper of Hamelin. How to reach the silver ledges was the absorbing thought, for beyond the Sierras the riches of their dreams appeared before them, and neither inexperience nor poverty could deter such passionate pilgrims from joining the odd troop which began its march over the mountains while the passes were still impassable.

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[1] Henry de Groot, San Francisco, Cal., 1880.

[2] Early Times.—(Territorial Enterprise, June 20, 1875.) Henry de Groot.

The boat from San Francisco to Sacramento left the wharf reeling under its load of freight night after night—its decks lumbered up with packages of food, tents, blankets, kettles, and tools, and covered with sprawling figures discussing the interminable silver question and their Washoe Mecca in a dozen different tongues, or snatching uneasy moments of sleep amid the confusion of the moving babel.[2]

From Sacramento the old emigrant trail led by the way of Placerville over Johnson's Pass into the Valley of the Carson. Although this had been the path of the great overland migration, the road was a rudely-broken track, scarcely fit for wagons even in summer, and when the advance guard reached Placerville the movement was checked by the snow blockade[3] and hundreds of tons of freight accumulated in the streets of the town which could not be dragged across the mountains, although 50 and 60 cents per pound were freely offered to teamsters.[4]

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[1] Joseph Mosheimer, San Francisco.

[2] San Francisco Evening Bulletin, March 27, 1860.

[3] San Francisco Evening Bulletin, March 30, 1860; Special Correspondent, Placerville, March 28, 1860.

[4] Sacramento Union, March 31, 1860.

The stay was only a transient halt. Pressed on by the crowd behind and the wish to be first at the goal, the vanguard mounted the pass toiling through the snow.[1] Pack animals carried the necessary food, blankets and tools, or rude sledges were hastily framed and pulled by sure-footed mules harnessed in line over the summit. Cold, fatigue, and the dangers of the passage were disregarded. The fear of falling behind in the race for the ledges was the only dread.

Among this headstrong troop were a few shrewd traders, who saw a richer prize in the fortune-hunters than in their loadstone. None gauged the demand in the new district more accurately than John L. Moore, who left San Francisco on the 9th of March with his stock of goods, which consisted chiefly of 200 pairs of blankets, costing $2 per pair; 20 dozen tin-plates, costing 22 cents per dozen; 10 gallons brandy, costing $6 per gallon; 10 gallons gin, costing $3.50 per gallon; 30 gallons whisky, costing $3.75 per gallon; 10 gallons rum, costing $3 per gallon; and 70 gallons assorted wines and liquors of various kinds. The total weight of his invoice was 2,100 pounds. This load he was able to transport by wagon to Placerville, where he counted himself fortunate in securing a pack-train to carry it over the mountains to the new camp at the charge of 50 cents per pound. Emerging, at length, from the snowdrifts, he reached the camp on the last day of March, 1860.

The gaunt, liquor-laden mules were welcomed by the thirsty miners as well-springs in a desert are hailed by weary travelers. They could scarcely wait while he unpacked his stores, and grumbled at the delay in erecting his canvas tent, 15 by 52 feet in size. The first carpet laid in Virginia City was spread upon its floor, and the first American flag raised in the camp waved from its roof. A canvas partition divided the tent into bar-room and lodging-room, and the new hotel was then open for guests. The side-board of an emigrant wagon served as bar counter, resting on stakes driven into the ground. Before this elaborate preparation was completed the day was far advanced and the miners were ready to sack the store-house. When the precious liquors were at last ranged beside the bar an irresistible rush was made toward the counter, and

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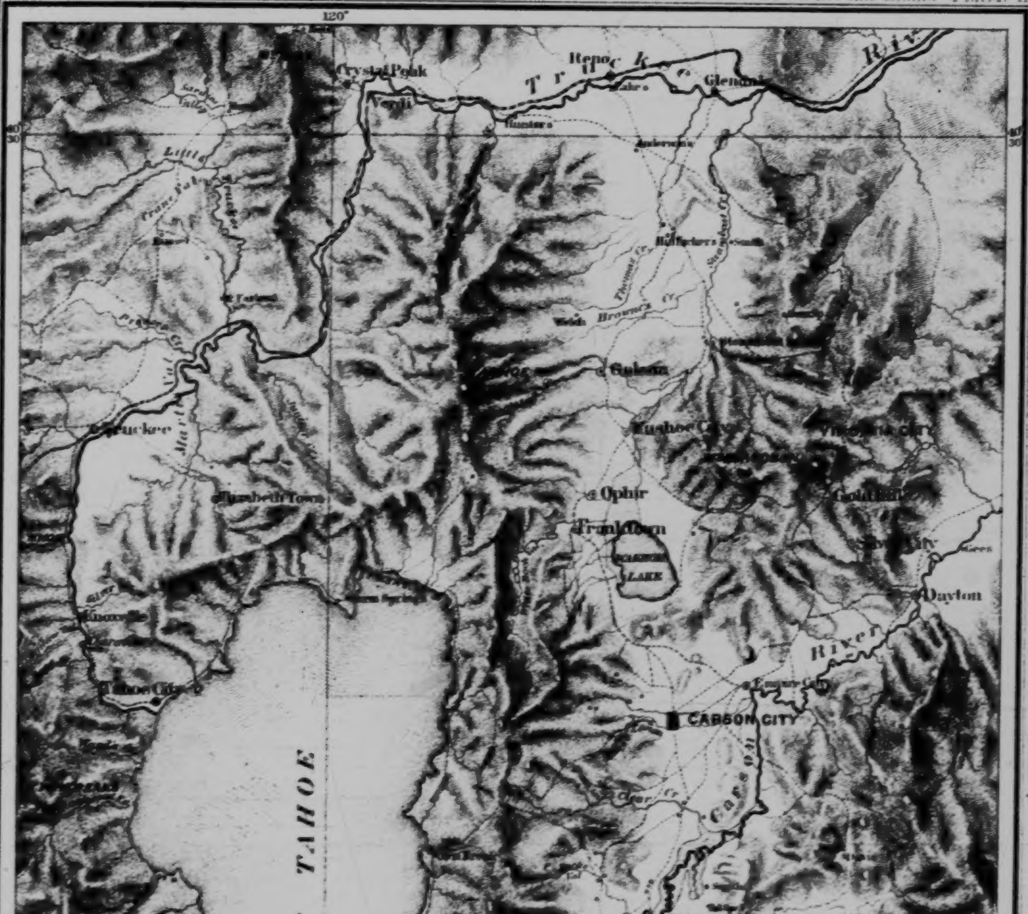
[1] San Francisco Bulletin, April 9, 1860.—(Special Correspondent, Carson City, April 2, 1860.


120°
Crystal Peak
Verdi
Reno
Truckee River
Glendale
Andersons
Galena
Washoe City
Virginia City
Ophir
Franktown
Washoe Lake
Gold Hill
Silver City
Dayton
Carson River
Carson City
Truckee
Elizabeth Town
Knoxville
Tahoe City
LAKE TAHOE
Clear Cr.
GENOA
Lake Valley
Fredericksburg
Double Springs
120°

Topography from State Survey of California Julius Bien & Co. lith. ELIOT LORD in Charge

MAP OF THE CARSON VALLEY.

the customers drank faster than they could be served. Two hundred dollars worth of liquor was sold before night-fall, but the thirst seemed unabated.

Thirty-six guests slept that night in the lodging-room, 15 by 30 feet in size, paying the charge of $1 for the use of a pair of blankets spread on the ground, and more than fifty applicants for lodging were turned away. A few favored inmates laid their heads down on pillow ticks stuffed with hay, but the stuffing cost 50 cents per pound, and only a few pounds were to be had at that price. To fill out the pillows shavings were brought from Gold Hill, but as the bundle was carelessly left outside the tent the starving mules of a pack-train devoured it before morning.

Fresh supplies of liquor continued to arrive, but food was still scanty. When the first load of flour was brought into camp the demand was so great that it was sold at auction for not less than a dollar per pound. Nails were in equal request, selling for a dollar per pound, and shovels brought $9 apiece. The profits of the retail trade may be surmised from the fact that Moore refused a cash offer of $8,000, five times the cost of his whole outfit, "for the lot" on the day before reaching the camp.[1]

As the snow melted on the mountains the prices of supplies fell somewhat, while the stir of travel increased. The camp was growing like a mushroom, when the news of an Indian outrage was brought to the mines. Colored and garbled to suit the narrator's demand for vengeance the story ran that the Nyumas[2] had attacked without provocation a well-known station on the overland route, 20 miles from Virginia City, killed the owners, Oscar and Edwin Williams, as well as three strangers, their guests, and left the charred bodies in the ashes of the burnt cabin. James Williams, brother of the two station-keepers, alone escaped to tell of the massacre.[3]

The probable inaccuracy of this report was observed by a few of the cooler heads, but the majority did not stop to hear the other side of the story. Many did not care whether the Williams brothers were the original aggressors or not.[1] It was enough for them to know that the Indians had assumed to act as judges and executioners, for pioneer lynch-law was very different from Pi-Ute lynch-law. So the appeal for vengeance was echoed by a hundred throats and a motley company mustered from the mining towns and the settlements in the valley, poorly mounted and armed as a rule with wretched muskets and shot-guns, but elated with the transient excitement and the fancied opportunity of "teaching the red devils a lesson."[2]

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[1] John L. Moore, Virginia City, Nev.

[2] Popularly termed the "Pi-Utes."

[3] Sacramento Union, May 9, 10, 1860; San Francisco Evening Bulletin, May 12, 1860; Adolf Sutro, Bulletin Correspondent, May 9, 1860; San Francisco Herald Correspondent, Carson City, May 16, 1860; Henry de Groot.

The Pi-Utes had been so inoffensive and placable that the idea of their offering any organized or stubborn resistance never entered the minds of the one hundred and six avengers who constituted the irregular posse and intended to administer even-handed justice to the offenders by putting to death as many of the tribe as fell into their hands. Fortunately they met no stragglers on the march down the valley, as the fires of the Pi-Utes, kindled from hill to hill, had given warning of the movement of the enemy, and the tribe was massed near Pyramid Lake, at the mouth of the Carson River.[3] Besides, the whites advanced so openly and boisterously that no herald was needed to clear the way before them.

They passed the burnt station and followed the course of the Carson through the desert. As they entered the narrow, rocky valley near the shore of Pyramid Lake they saw a body of mounted Indians on a ridge half a mile distant, and when they approached nearer four or five Indians were observed to separate from the main body and gallop up and down before the advancing force of whites, brandishing guns or spears in a defiant manner as was thought.[4]

One chief rode forward holding aloft a white object on the end of a staff. Strangely enough this flag of truce appeared to the whites "a shining battle-axe or tomahawk of tin,"[5] and a shot was fired at the bearer, causing him to wheel his black horse suddenly and ride back to his companions.

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[1] Henry de Groot, Isaac E. James, Frank Soule.

[2] Sacramento Union, May 14, 15, 1860.

[3] Natches, grandson of Winnemucca, chief of tribe, 1860.

[4] Adolf Sutro, Correspondent San Francisco Bulletin, Virginia City, Nevada, May 15, 1860. Full report from statements of Capt. A. McDonald, Joseph Baldwin, and others, "the most trustworthy members of attacking party."

[5] Sacramento Union, May 31, 1860.

At this rebuff the Indians "yelled like demons," and dismounting from their horses, which remained standing motionless,[1] descended the ridge and began firing at the whites.

The leader of the attacking company, Major Ormsby, then gave the order to charge, and as the men rushed up the ridge the Indians fell back, and remounting, charged over the valley-bed in squads, wheeling and circling about in the deep sand so rapidly that the tired horses of the whites could not follow them.[2] At the same moment a second body of Indians on foot attacked the scattered company on the flank[3] and a desultory skirmish began which lasted until the whites, by Ormsby's order, retreated to a deep gulch near the bank of the river, content to maintain a position of defense.

Here the Indians were held in check for some minutes, when a third division, three or four hundred strong, were seen to advance from the river with the evident intention of attacking the whites in the rear and cutting off their retreat. Outnumbered and outmaneuvered, "a great panic seized us," said McDonald, one of the leaders, "and a majority of our men broke for the river." The remainder were obliged to follow, a few halting stubbornly and firing last shots with desperate courage.[4]

Inflamed by success, the Indians swept through the valley in pursuit like hounds when the fox is in sight,[5] overtaking and burying one victim after another under the weight of their writhing bodies. So Ormsby died with twenty hands at his throat, though shielded for a moment by Natchez, grandson of the old chief.[6] The retreat became a mad race for life, and only half of the fugitives reached the valley towns in safety.[7]

The contempt for Indian strategy and prowess was changed instantly to a natural but probably causeless fear. The Pi-Utes had made a skillful defense under the direction of their young chief, Winnemucca, and his lieutenant, Joaquin,[1] but they had no intention of following up their advantage by an aggressive movement; in fact the elder Winnemucca, patriarch of the tribe, had counseled peace, and it was by his advice that the flag of truce was borne by Joaquin.[2]

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[1] A resemblance worth noting to the training of the horses of the Suebi.—(De Bello Gallico, Comm. III, chap. I, II.)

[2] Adolf Sutro, May 15, 1860.

[3] Natchez, grandson of Winnemucca, 1880.

[4] Sacramento Union, June 4, 1860; Carson Valley Correspondent, May 29. 1860.

[5] Ira A. Eaton, San Francisco Alta Correspondent, May 15, 1860, Virginia City.

[6] Natchez.

[7] "Seventy-six killed;" William Wright, "Big Bonanza," p. 120; Editor of Sacramento Union, June 4, 1860. "Fifty-nine, including wounded;" record from company rolls furnished San Francisco Evening Bulletin by A. B. Trask, probably more accurate.

The Indians had been harassed in many ways by the increase of the white settlers, but had endured the necessary evils with singular patience. Their fish-preserves had been pre-empted by squatters and their pastures about Pyramid Lake eaten bare by intruding cattle.[3] They protested against the action of the stockmen,[4] but retaliated in no way until two young girls of the tribe were decoyed by the Williams brothers into their station and most brutally treated.[5] After an anxious search the relatives of the girls found their prison, and in the natural fury of revenge cut down the offenders and set fire to their cabin. No innocent person was harmed, and the punishment of the guilty was in accordance with the tribal customs and frontier notions of justice. When the tribe was attacked indiscriminately by the party under Ormsby the lesson given was a wholesome one, but neither expected nor pleasing. It was so instructive, however, that the mistake of undervaluing their opponents was not committed a second time.

The news of the fight at Pyramid Lake was telegraphed across the mountains to California, and a force of cavalry, artillery, and irregular militia troops were dispatched in answer to the panic-stricken call for help.[6] Virginia City was put under martial-law.[7] Some of the women and children were sent across the Sierras and the remainder were placed in a rude stone block-house.[8] Prospecting holes and tunnels were deserted; the miners enrolled themselves hastily in companies; rusty arms were furbished up; old scraps of lead and water-pipes were melted and cast in bullet-molds; the camps and valley settlements were scoured for stray flasks of powder; guards were stationed at different points in the town and patrols watched outposts on the surrounding hills.[9]

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[1] Natchez, grandson of the elder Winnemucca.

[2] Natchez.

[3] Frank Soule, writing from Virginia City, April 21, 1860.

[4] Henry de Groot.

[5] Sarah Winnemucca, granddaughter of Winnemucca; Henry de Groot.

[6] Indian Campaign, 1860.—(Territorial Enterprise, June 21, 1872.)

[7] San Francisco Evening Bulletin, May 13, 1860.

[8] Henry de Groot, Isaac E. James. San Francisco Evening Bulletin, May 21, 1860.

[9] Henry de Groot

Some more phlegmatic spirits laughed at the warlike fever, but the alarm was contagious.[1] Finally, a force of 1,000 men was assembled in the valley and marched against the Pi-Utes, the regulars under command of Captain J. Stewart and the militia under their chosen colonel, John C. Hays (May 29, 1860).[2] The Indians resisted bravely in a sharp skirmish near the place of their former action,[3] but were overmatched and fled to the deserts extending to the northeast,[4] and after a vain attempt at pursuit the little army of whites returned to the valley and disbanded.

Meanwhile the rush to Washoe, which had been checked by the report of the Indian victory, was renewed with greater vigor than before. The motley train which stretched in a broken line from Sacramento to the mines calls to mind the grotesque march to Finchley. Old men and young, waifs from many nations, who had drifted during ten years to the Californian gold fields, with every variety of dress and equipment, mounted and on foot, driving pack-mules, burros, horses, and oxen—dusty, muddy, tired and foot-sore—this oddly-assorted company was knit together by the bond of a common purpose. In the little stations on their route Piedmontese and Cornishmen, Jews and Catholics, mechanics and scholars, honest men and rogues, snatched their food hastily from the same rude board, splashed with all the stains which the medley of dishes could furnish, and slept at night on the same bed of straw. When morning came they crawled out from the straw unwashed, unkempt, stiff, bitten by fleas and bugs, and began again their tedious march to the valley of the Carson.

Along the South Fork of the American River the road during the spring months was for miles a trough of mire, so deep that the mud was often pushed along by a wagon body for rods until the creaking cart came to a stand still, only to be plucked out by the help of a following team, which could not otherwise pass. Volleys of oaths urged the struggling mules up the steeper grades, and the mountain walls re-echoed the incongruous sounds with startling effect.[1] The descent to the valley led through Carson Cañon, a precipitous gorge, down which the wagons slipped, pitching and creaking, while the grating shoe-brake squeaked incessantly.

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[1] Sacramento Union, May 19, 1860.

[2] San Francisco Evening Bulletin, June 7, 1860; Special Correspondent with troops, May 30, June 1, June 2, 1860.

[3] June 2, 1860.

[4] Sacramento Union, June 9, 1860. A few months later they were permitted to return unmolested to their homes on Pyramid Lake, and to mingle as curious visitors with the citizens of the mining camps.

"The jolts and jars became a torture," wrote a passenger descending in one of the over-crowded coaches.[2] "We left the stage with one accord and watched it rolling and pitching about among the rocks. The wheel-horses, threshed about by the jerking, swaying pole, stagger and groan, and the leaders stop and look about them in amazement, wondering, no doubt, at the cool impudence which could locate a road in such a place." Yet a city in the desert must be built up and sustained by supplies transported over this Sierran barrier. Wagons succeeded pack-mules and sledges. Through the slough along the bank of the American River only one-third of a full load could be pulled,[3] and to carry 1,500 pounds of freight 50 miles from Placerville $120 was paid in April, 1860. In May more than 2,000 animals were employed in the work of transportation as the road became more passable, and freight charges fell to 18 cents per pound from Placerville to the mines,[4] or $630 for an average wagon load of 3,500 pounds.

In September, 1860, three hundred and fifty-three wagons, drawn by four or six mules generally, were counted going and returning between Placerville and Carson Valley,[5] and fifty additional wagons were said to be loading and delivering goods at each end of the route. The round trip was made in from twelve to twenty days, and an average of eight trips during the season. Consequently (453 by 3,500 by 8) 12,764,000 pounds were transported by freight wagons alone, beside nearly 1,000,000 pounds more by pack-mules and other conveyances.[6] If the amount of custom freight be put at 13,500,000 pounds and the average tariff at 10 cents per pound—a low estimate—the amount paid for transportation in 1860 was $1,350,000.

Words can scarcely picture the chaotic confusion in which the camp was plunged by the arrival of these motley swarms. Wretched huts of canvas, wood, and cobble stones covered the slope, forming a shapeless city traversed by three main lanes[1] styled streets by courtesy. A restless crowd blocked these narrow passages, flowing in and out of their bordering saloons and gambling houses.[2] The cheerless hovels were deserted for these lighted rooms, the real homes of the citizens. Little stacks of gold and silver fringed the monte tables and glittered beneath the swinging lamps. A ceaseless din of boisterous talk, oaths, and laughter spread from the open doors into the streets. The rattle of dice, coin, balls, and spinning-markers, the flapping of greasy cards and the chorus of calls and interjections went on day and night, while clouds of tobacco smoke filled the air and blackened the roof-timbers, modifying the stench rising from the stained and greasy floors, soiled clothes, and hot flesh of the unwashed company.[3] Sometimes the sharp crack of a pistol would bring the players to their feet and the doorway would be choked with a wild rush of all except the two who were settling a trifling dispute by an effective Washoe duel across a table. When one or both of the disputants were proved to be in the wrong by the issue of the trial by combat, the scattered crowd returned to their former seats with a universal call for liquors, simple and compound.

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[1] San Francisco Evening Bulletin, April 9, 1860.
[2] Sacramento Union, November 15, 1859.
[3] San Francisco Evening Bulletin, April 9, 1860.
[4] San Francisco Evening Bulletin, May 12, 1860.
[5] Territorial Enterprise, September 29, 1860.
[6] Placerville Democrat, September 29, 1860.

Without and within doors a fever of speculation raged without check.[4] Sales of claims for money were comparatively rare, but barters were incessant. "Feet" in a thousand locations on cropping rocks or bare ground were bought and sold indiscriminately. The position or existence even of most of these so-called ledges was scarcely known, but this made little difference, for all claims had a nominal, if fictitious, value and were serviceable for purposes of exchange. Paper fortunes were made in days by shrewd sales or rumors of rich "strikes" and "assays." Pockets and hands were filled with bits of quartz or country rock and samples were brandished in the faces of friends and strangers wherever met. Eyes were strained to detect invisible specks of metal; pyrites was boastingly pointed out as gold, and pieces of worthless galena were gravely presented as black sulphurets of silver.

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[1] Henry de Groot.

[2] San Francisco Evening Bulletin, March 16, 1860.

[3] Sacramento Union, April 25 and October 8, 1860.

[4] Harpers' Magazine, December, 1860; Peep at Washoe, J. Ross Browne.

Working miners formed a small part of the speculative troop which had crossed the mountains. Probably half were a swarm of drones, many of whom were penniless and worthless as laborers in any capacity. They could sleep on the sage-brush and in holes like gophers, but they could not eat bitter wood or sand, yet they contrived to subsist by various devices—borrowing money from lucky gamblers, haunting free-lunch counters, pledging "feet" with reckless butchers and bakers, or picking the pockets of good-natured friends. The healthy growth of the camp was hindered by the access of these vagrants even more than by the presence of the unorganized band of bravos who began to bluster about the streets—for one was a clog, the other merely a gad-fly.

The Indian war had demonstrated the utter inefficacy and feebleness of the civil authority of the district, vested in a justice of the peace and constable at Virginia City and a probate judge at Gold Hill. This was, indeed, so clearly evident before that meetings had been held during the previous year to elect delegates to a so-called Constitutional Convention, which had actually assembled at Genoa July 18, 1859, and framed a constitution ratified at a popular election for State officers, September 7, 1859.[1] Unfortunately no provision had been made for defraying the expenses of this independent government, and as the legislative assembly-elect was powerless to levy taxes or enforce its authority, it adjourned after gravely receiving the first annual message of the governor, Isaac Roop, and passing a sufficient number of well-intended resolutions.

The first apparent result of this malcontent demonstration and the appeals to Congress to dismember Utah by creating a new Territory out of its western counties, was to call down upon the heads of the impertinent colonists the long gathering indignation of the Utah Church Council, expressed in vigorous language by the editor of the Salt Lake Mountaineer, a prominent member of the Church of Latter Day Saints. After emptying a vial of wrath in a long and bitter rebuke, he shook out the last drops with the concluding malediction: "Since the first organization of the Territory, Carson has been a most unremunerative burden upon

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[1] Territorial Enterprise, July 13, 1860, "Nevada, its Past and Present;" Nevada Directory. 1862, "Political History of Nevada;" Territorial Enterprise, June 13, 1872, "Historical Reminiscences."

Utah. What is she now? A worthless unaccountable scab, which cannot find a place in any class of an honest vocabulary. So let her remain, dried up, buried, and forgotten!'"[1]

Thus gall was given where oil was needed and the citizens of the district were left without relief. The natural confusion incident to the rapid growth of a new mining camp and the clashing of its turbulent elements was aggravated beyond endurance by the lack of any dominant authority. The irregular provisional government proved an ineffective farce; the legal Territorial government was estranged and sullenly inactive, and the few county officers were scarcely more than figure-heads.

The floating scum of the Californian mining towns drifted naturally to the new camp, and their number was swelled by accessions from the volunteers for the Indian war.[2] They had been tacitly allowed to equip themselves for the alleged defense of Virginia City by levies of all sorts for the good of the service, and this guerrilla method of carrying on the war had rendered them absolutely reckless of any restraint.[3] They lolled on gambling tables and the bars of saloons and swaggered about the city at all hours of the day and night. Peace-loving citizens avoided them, but made no effort to call them to account for their frequent outrages, for no jury could be obtained to convict them, and the attempt was certain to expose the complainant to the malice of the gang dreaded with cause. When they shot or stabbed one another in their brutal orgies there was a general feeling of relief, but the place of one dead scoundrel was soon filled by a new-comer.

No adequate conception of this seething life can be given by the method of separate generalities, as Carlyle terms it,[4] but characteristic incidents must be sought for. The most prominent figure of the crew was a burly ruffian known as Sam. Brown, who had killed thirteen men in Texas and California, as was reported, before his arrival at Virginia City.[5] The terror and aversion which this man inspired recall the nursery tales of the days of ogres and their victims.[6] In the summer of 1859 an agent of the leading western express company called at a station which Brown was then keeping on the Humboldt River and desired something to eat. Brown pointed to a hanging strip of bacon, and the traveler requested the loan of a knife to cut off a slice. With an odd smile Brown pulled out his immense sheath-knife, but immediately thrust it back into his boot-leg, remarking that he had killed five men with that knife and was superstitious about lending it to cut bacon. The visitor was equally scrupulous, and left the cabin without the meat.

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[1] Sacramento Union, December 22, 1860.

[2] Henry de Groot. San Francisco Evening Bulletin, May 31, June 1, 1860.

[3] Henry de Groot, William A. Stewart, James Morgan.

[4] Carlyle's Essays—Burns.

[5] William A. Stewart.

[6] Territorial Enterprise, July 13, 1861. "Brown's Obituary."

One of Brown's first exploits in the new mining district was a murder, which illustrates vividly the character of the man and the camp. A weak, underwitted bar-room lounger, whose feeble discretion was lost in liquor, staggered up to Brown one day in a saloon and made some remark which the latter considered offensive.[1] Without a word the giant wound his muscular arm about his victim and, holding him as easily as a cat does a mouse, drove a sheath-knife twice into his quivering body, turning it "Maltese fashion" in his vitals.[2] Then he flung the bleeding sufferer on the floor, and when, a few moments later, a party took up the man, still breathing faintly, from the red pool beneath the bar, Brown was seen sleeping as calmly as a child on a billiard table in the room.[3]

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[1] Henry de Groot, first Census Marshal Nevada Territory.

[2] Frank Soule, May 25, 1860, Correspondent San Francisco Alta.

[3] James Morgan, eye-witness, San Francisco, Cal.

CHAPTER V.

THE FOUNDATION OF A GREAT MINING TOWN.

To multiply scenes like this would serve no useful purpose, for repetition would not convey a more adequate impression of the camp. Ross Browne did not hesitate to liken its restless life to the tumult of hell, and his picture is not greatly over-colored. Ruffianism was rampant, and a writer could scarcely exaggerate the turbulence of the surface life; yet much of the noise and turmoil was empty sound. Thus the street exchanges which had the most striking semblance to pandemonium were really harmless stock marts, and buyers and sellers acted no more insanely than the concourse of howling brokers who buy and sell in the present stock boards. It was the incongruity of the scene which affected an observer so deeply. A troop of chattering gamblers were troubling the peace of the desert hills, and when stillness so profound was broken by such discordant sounds, one almost looked to see an outraged spirit start from the rocks with a warning *procul profani*. To parallel the scene the New York Stock Exchange must be transported to the top of Mount Rigi, as a looker-on suggested, and even that miracle would fall short of the strange reality, for no organized body of gamblers could be so oddly assorted as the people of this mining camp, united only by one tie of sympathy.

The gambling fever, affecting its victims generally with delirious blindness, and spreading from Virginia City to San Francisco, received its first check toward the end of April, 1860. As was natural, San Francisco, lying at a distance from the immediate seat of the disorder, was the first to recover partially from its effects. This convalescence was commented upon with some bitter humor by a correspondent of the San Francisco Evening Bulletin, gravely styled an "Old Resident of Washoe," by the Bulletin editor, who wrote from Virginia City under date of May 8, 1860:

"We are informed that there is a panic in San Francisco in relation to our mining stocks; that nothing will sell; that even Ophir, Washoe, Chollar, and Corsair are drugs in the market; that banks won't discount Washoe speculators' paper; that Lady Bryan sells for $15 and Rogers for $40; that the bottom has fallen out, confidence gone, and that there is a general collapse.

"Two months ago these wise men of Gotham, who are now decrying the mineral resources of Washoe, went to sea in a bowl and got badly wet.

"Two months ago everything would sell. People bought blindly in the 'Bob Ridley,' 'You Bet,' 'Last Chance,' and the 'Bob-tail Nag.' Where they were located, what was the character of the rock, who the locators, what the title, was not a matter of inquiry.

"The price and number of feet were only matters of interest to the greedy buyer; fools at your end of the telegraph were deceived by knaves at our end, and we sent you mysterious hints of new discoveries that never existed, strikes in mines never located, accounts of sales which never took place.

"Your prudent men, who would not buy a foot of land in San Francisco or make a loan without careful search of title, have risked thousands without a thought. Your greedy folly was taken advantage of by our avarice, and you became the victims of your own sublime stupidity and dishonesty. A change comes and a panic. There are prudent men in San Francisco and honest men in Washoe, and when this class of operators had time to exchange opinions and stem the current of senseless and blind speculation it was found that many of the transactions in silver mines were but sales and exchanges in stone heaps. The result was naturally enough a reaction. Wild-cat claims became valueless and good claims staggered under the blow."

Virginia City looked to San Francisco to furnish the means for the development of its mines, for none except the Ophir, Mexican, and a short line of claims at Gold Hill were self-supporting in 1860, and the reckless squandering of capital upon worthless plots of ground was in a measure stopped by the reaction in April. Some proof, indication, or probability, at least, of the existence of ore was afterwards demanded, as a rule, before actual money investments were made.

The difficulty still remained, that even when such precaution was taken it was impossible in most instances to ascertain the real value of the claims without costly and long-continued explorations. The California Mercantile Journal stated that "four thousand claims were located within a radius of 30 miles around Virginia City, as nearly as the true number could be ascertained," and the estimate was probably a fairly correct approximation.[1] The great majority of these claims were evidently worthless and would scarcely tempt the most ignorant or unwary speculator; but many of them appeared promising, and time and money were requisite to prove that their outward show was commonly a deception. "Nine hundred men are engaged at present in opening three hundred claims. It is an established fact that at least twenty valuable mines do exist, this number being thoroughly opened."[2] The writer in the Journal expressed himself more cautiously than was usual at the time, and yet experience has shown that in mining "established facts" are oftentimes unsupported fiction. Of the twenty thoroughly opened and valuable mines less than half have ever yielded any return to the labor and capital expended in their development; of the four mines of high repute cited by the correspondent of the Bulletin, as if their value should be above suspicion or question, two—Washoe and Corsair—were absolutely worthless.

In order to abate the speculative fever effectually, careful examinations of the claims by trained and honest observers were requisite, and systematic explorations should have been made to determine mooted points; but at that time few competent mineralogists and practical silver ledge miners were on the ground and the waste of time and money was therefore inevitable. Few claims were steadily or systematically developed, but the random ignorant search of the previous year was continued. The hills were gashed with rude cuts in every direction for miles around, and heaps of coarse yellow sand and rocks defaced the sage-brush covering, changing to pale-green in the early summer, and sprinkled with myriad sunflowers.

On the line of the Comstock ledge the inclines sunk by the Ophir,

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[1] California Mercantile Journal, 1860. *Vide* Appendix—Table of Recorded Locations, Virginia and Gold Hill districts, 1859, 1860.

[2] California Mercantile Journal, 1860.

Mexican, and Central mining companies were advanced to a depth of 50 feet, when water began to flow into the shafts so rapidly that further progress in depth was deferred for the time and drifts were cut along the course of the sulphuret vein. The accumulating water was drained out through small adits cut to the foot of the inclines from points below the croppings.[1]

To the north and south of these three claims adits were cut with the view of striking the ledge at a depth of from 30 to 100 feet, not only because this was judged to be the cheapest and most efficient method of prospecting the ledge, but because the croppings and subsoil rock on many claims yielded little or nothing, and it was believed that the quartz would prove richer at a distance from the surface.[2] Little timbering was done in these adits, which were rarely more than seven feet high and five feet wide; but the roof was supported when timbers were needed by two upright posts and a cap.

Rude as were these early workings, yet where so much ledge-cutting was done the aggregate ore product was naturally considerable. How to dispose of it became the most pressing question of the day.

It was evident at the outset that the mines could not be opened with success unless a cheap method of reducing the ore was devised. The capitalists who had bought the ledges would have spent their money to better advantage in buying the rocks on the Pacific beaches, if the gangue could not be worked at a profit. The problem presented was not an easy one to solve. Reduction by smelting was the most effective process, but this was barred, except in the case of the richest ore, by the cost of fuel, labor, and transportation. Some ore had been reduced in arrastras, but that method was slow at the best and could only be employed to advantage in working gold-bearing quartz on a small scale. Whether the Comstock ledge ore could be profitably or successfully reduced by other known processes was an undecided question.

The free gold in the Californian quartz ledges had been extracted by simply crushing the rock under iron stamps lifted by cams on a revolving shaft, while the powdered quartz was washed away by a flowing stream of water over mercurialized copper plates and blanket-sluices. The silver sulphurets and sulphates of the new mining district could not be reduced, however, by this primitive and simple process. Another method must be employed.

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[1] San Francisco Evening Bulletin, April 23, 1860. Letter from J. W. Simonton, Corresponding Editor Carson City, April 13, 1860. San Francisco Evening Bulletin, July 11, December 13, 1860.

[2] San Francisco Evening Bulletin, February 25, 1860. List of Tunnels and Shafts, from R. E. Brewster's Diagram.

A hundred years before, Don Francisco Zavier de Gamboa had strongly commended the process of reduction by the use of the cazo or kettle as the most speedy method of extracting the silver from ore. In this process the ore was first ground as finely as possible under the stamps of a mill driven by water or horse-power. The stamps were simply six wooden posts with iron heads placed in a row and made to fall repeatedly, by means of a simple adjustment, upon a layer of ore at the bottom of a large wooden mortar or trough lined with iron. The powdered ore was dashed by the fall of the stamps through iron sieves inserted in the side of the mortar bed or in simple hoppers attached.[1] When the ore had been thoroughly ground, a quintal in weight of the powder was taken and mixed with salt, water, and quicksilver in certain proportions, which varied with the character of the ore. The pasty mass was then placed in a copper pan or kettle over a fire and constantly stirred in order to insure an intimate mixture of its constituent parts. While boiling the pulp it was tested from time to time to ascertain whether it required any further addition of mercury or salt. Alonzo Barba, a priest of Potosi, had further suggested the use of a single furnace to heat four pans, thus economizing the consumption of fuel.[2] The mixture in the pans was allowed to boil during four hours, when it was considered that the pulp had been thoroughly amalgamated, and the slime was separated from the amalgam by washing the contents of the pans in vats of water.

This well-approved method, described by Gamboa, was in general use in Mexico and Peru at the time of the discovery of the Comstock mines. In many details it was clumsy and comparatively ineffective, but during the century which had passed since the appearance of Gamboa's treatise no material improvement had been devised, and it remained for the inventive talent of Californians to develop and perfect the process.

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[1] Gamboa's Commentaries, Heathfield's Translation, vol. II, p. 200.

[2] Ibid., Heathfield's Translation, vol. II, p. 203.

The clumsy wooden stamps fastened rigidly to a beam had been replaced in 1853 by symmetrical iron cylinders, raised by cams attached to a revolving shaft,[1] and the iron plates or shoes at the lower ends of these cylinders were so constructed as to be readily removed and fitted with a new set when the old were worn out.

In 1858 Israel W. Knox, of San Francisco, had designed a light iron pan 4 feet in diameter and 14 inches deep, which would hold a charge of pulp weighing about 250 pounds. To stir the pulp a light iron muller was used, resting on iron dies at the bottom of the pan, the total weight of muller and ring being 125 pounds. Copper cross-boards were attached to the sides of the pan to make the reduction of the ore more speedy, as it was noticed that the amalgam was attracted by these copper plates immersed in the moving mass of pulp, and could be easily scraped off from their surfaces when the plates had become coated. Mr. Knox had no thought, however, of attempting to grind the crushed ore still more finely between the surfaces of his muller and dies.[2] His muller was designed to circle about slowly in the pulp, making only twelve or thirteen revolutions per minute, and to insure an intimate mixture of the crushed ore and mercury with a ligneous acid which he expected would prove of marked service in the process of amalgamation. The acid was soon discarded, but the pan was found to be fairly serviceable for the reduction of gold-bearing quartz, and the Miners' Foundry at San Francisco, established during the winter of 1859-'60 by William H. Howland, Horace B. Angell and E. T. King, received a number of orders from various mills in California for sets of this design.[3]

Shortly after the opening of this foundry another inventor, Henry Brevoort, an ingenious mill proprietor of Sonora, Tuolumne county, California, sent a set of castings to its proprietors, somewhat clumsy in form but embodying an original idea in pan construction.[4] Brevoort's pan was fitted with a heavy muller and ring weighing 1,400 pounds when the shoes were attached, and expressly designed to grind the pulp more finely than it could be pulverized by the stamps. The ore was to be crushed wet in the battery and thence conducted into the pan, where it was ground and amalgamated.

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[1] First iron straight frame battery constructed for Joseph Moore in 1853. First rotary frame battery constructed in 1858. H. B. Angell and William H. Howland, San Francisco, Cal.

[2] Israel W. Knox.

[3] H. B. Angell; W. H. Howland, San Francisco, California.

[4] U. S. Patent Office Reports, 1859, No. 25,243.

The heavy rotating muller of Brevoort with central openings was not, strictly speaking, a novel invention, as a similar design had been described by Overman,[1] and J. E. Clayton afterward testified under oath that he had constructed a machine for the reduction of gold ores in Tallahoosa, Alabama, as early as 1845, embodying substantially the same principle;[2] still, as no pans of this design had ever been adopted for general use in the reduction of ores, and Brevoort had undoubtedly fashioned his muller without knowledge of the previous application of the same principle, except in the rude Mexican arrastra, he is entitled to whatever credit is due for its introduction. Moreover, Clayton's grinding muller was stone, and in the substitution of iron Brevoort had made a change of no slight importance. His use of a solution of nitrate of mercury, in connection with a galvanic battery, to facilitate amalgamation in the pan[3] was, perhaps, equally ingenious in conception, but has so far been discarded in practice.[4]

The application to the reduction of silver ores of the Brevoort method of grinding the pulp between iron surfaces was yet to be made. It is probable that the inventor had no notion of the important assistance rendered to the process of amalgamation by the presence in the pulp of the fine particles of iron, which were chafed away by the friction between the grinding faces of the muller and dies. He thought only of reducing the pulp-sand as finely as possible in order to insure the contact of the mercury with the most minute particles of gold. Yet he advanced the process of silver ore reduction a long step by finely pulverizing the pulp, by producing heat and certain serviceable electrical conditions through the instrumentality of friction, and by substituting iron for the more costly metal (mercury) as an absorbent of the freed chlorine.

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[1] Overman's Metallurgy, p. 267.

[2] Suit of Thomas Varney *vs.* Zenas Wheeler *et al.*, 1864, U. S. Circuit Court for Northern District of California.

[3] Report of Commissioner of Patents, 1859, vol. I, p. 559—Gold Amalgamator, Patent No. 25,242, issued August 30, 1859.

[4] The first pan of the Brevoort model constructed by the Miners' Foundry was cast to fill an order received from the Herbertville Quartz Mining Company, dated December 11, 1859, though the inventor had one of his own pans in practical operation at an earlier date.—(Order Books, Miners' Foundry, 1859-'60.)

The patterns from the castings furnished by Brevoort had scarcely been made when the device of a third inventor was brought to the Miners' Foundry.[1] Selim E. Woodworth, of San Francisco, had conceived the idea of a pan in which steam should be introduced into the pulp through the hollow arms of a revolving muller. Orders were given to the Miners' Foundry on March 29, 1860,[2] for working pans of this pattern by the inventor and the firm of Ward, Curtis & Woodworth, who had a quartz mill at North Beach, San Francisco, at the time.

On the combination of the principles outlined by the inventors of these early pans the Washoe pan process is based. In the Spring of 1860, however, their designs were still uncombined and crude. Brevoort did not contemplate the introduction of steam, and the mullers of Woodworth and Knox were light and not intended for service as grinding instruments. When the first order was given for mill machinery to be shipped to the Washoe mining district, the proprietors of the Miners' Foundry were not prepared to recommend any more serviceable pans than that invented by Mr. Knox.

Almarin B. Paul, an enterprising mill-owner in the city of Nevada, Cal., had been strongly urged by his friends, who had bought claims in the Washoe district, to build a mill in the vicinity of the mines and attempt the reduction of the ore from the ledges.[3] Impressed by their representations, he visited the district in the autumn of 1859 and took back with him to his mill in California sample sacks of the ore from the mines of the Mexican and Ophir companies. After a few careful experiments in reducing this selected quartz he determined to undertake its reduction on a large scale. His venture was a hazardous one. To capitalists generally it seemed a foolish investment. The leading assayers of San Francisco laughed at his project and predicted failure; the Ophir and Mexican companies refused to make contracts with him for the reduction of their ore, although hundreds of tons of quartz were lying on the surface of their claims rich in gold and silver yet too poor to pay the cost of removal and smelting, but, in spite of all obstacles, Paul's resolution was unshaken. He persuaded some friends to unite with him in subscribing the requisite capital, and the Washoe Gold and Silver Mining Company No. 1 was formed in the month of March, 1860.[1]

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[1] W. H. Howland, H. B. Angell. [2] Order Book, Miners' Foundry, 1860. [3] Almarin B. Paul, 1880.

Under their direction Paul began at once to build the proposed mill. The crushed ore could not be reduced without water, but the little streams flowing down the cañons were already held by parties of miners and a fresh supply must be obtained from some quarter. Four miles south from Virginia City, near Gold Cañon, was a little basin, the centre of drainage from the surrounding hills. With the quick eye of a practical mill-man this spot was selected as a building site. A shaft was sunk to the depth of 50 feet and a cross-drift cut in the bed-rock 100 feet in length. Water trickled into this T-shaped chamber until the well was nearly full, and one difficulty was thus removed. Meanwhile contracts were secured from owners of claims on Gold Hill to crush and reduce 9,000 tons of ore at from $25 to $30 per ton—if the quartz would yield a surplus profit to the owners at this rate.

In order to obtain this concession Mr. Paul was obliged to pledge the completion of his mill in sixty days from the date of the signature of the contracts, June 12, 1860. Work on the mill-site had been begun on May 25, 1860; the mill machinery had been ordered, by letter dated Virginia City June 7, 1860, of Howland, Angell & King, and the order had scarcely been received when the contracts were signed; still, he did not hesitate to take the risk, but pressed the work with all possible energy. The San Francisco firm rivaled him in dispatch. The completed castings were forwarded by steamer to Sacramento, and from that point by wagon-trains over the Sierras. Through the snow, rocks, and mire of the old emigrant trail the straining mules, urged on by curses and blows, dragged the iron freight to the basin in the hills, where he was anxiously awaiting its arrival. He had built rude stone foundations for the stamp-batteries and was covering the walls of a rough framework shed over them with boards from a forest twenty miles away. The distance was not great, but this lumber was cut on a mountain slope, hauled to a saw-mill overpressed with work though running night and day, and at length dragged up a rocky cañon to the site of the mill, where it was put together with nails brought on the backs of mules across the mountains. The cost of transportation from San Francisco to the mill far exceeded the original cost of the machinery, ranging from 13 to 25 cents per pound. Lumber was $60 per M at the saw-mill, and this price was more than doubled by the added charge for delivery at Gold Cañon. These extraordinary expenses did not delay the work of construction, for the mill must be completed at any price within the allotted time. So rapidly did Paul and his men carry on the task that the first steam-whistle heard on the eastern slope of the Sierras was blown by his engineer, William H. Baker, on the 9th of August, and the 24-battery stamps of his mill began to crush ore on the 11th of the same month, the last day allowed for the fulfillment of his contract.[1]

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[1] Henry de Groot's "Pioneer Mills and Mill Men." Company formally incorporated June 11, 1860. Almarin B. Paul.

Toward the close of the work he had been pressed hard by two other enterprising mill owners, Charles S. Coover and Elias B. Harris, who exerted themselves in friendly competition to gain the honor of erecting the first mill in the district.[2] Their mill was a smaller one, containing one battery of eight stamps only, but their machinery was ordered later, June 21, 1860, and the contest for precedence was so close that their machinery was set in motion three hours after Paul's mill began work.[3]

These two mills were thus completed, but the question of their serviceability was yet unanswered. The first ore worked was five tons of tailings, refuse rock previously discarded by men who had attempted to reduce it in arastras and rockers, from the claim of Rice & Co., on Gold Hill, a portion of the 50 feet located by James Finney. The mortar or bed of the battery was surrounded by a wire bolting-cloth, through which the ore crushed dry was dashed in a misty cloud by the fall of the stamps, dropping on a platform outside. Here the powder was dampened sufficiently to admit of its removal in shovels to the pans, where it was mixed with water and mercury, and the pulp thus formed was ground by the revolving mullers.[1] Each pan held about 300 pounds of ore and 40 pounds of mercury, and with each charge a pint of salt and a few ounces of copper filings or sulphate of copper were used.[2] Water was conducted to the pans by pipes leading from a tank heated slightly by the exhaust steam from the driving-engine. The copper cross-boards in the pans were scraped twice a day, and the amalgam collecting at the bottom of the pan was drawn off at intervals through a discharge hole. When a sufficient quantity was thus obtained it was strained through a buckskin bag until the liquid mercury was pressed out and a pasty mass was left in the bag ready for retorting. Placed in a closed iron vessel over a fire this paste was steadily heated until the remaining mercury passed off in vapor through a pipe into a condensing chamber, where, upon cooling, it assumed its original metallic form. The bullion alloy of gold and silver remained in the retort.

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[1] Almarin B. Paul; Virginia City Territorial Enterprise, August 11, 1860. William H. Howland, San Francisco, Cal.; Comstock Papers, No. 15; Mining and Scientific Press, February 3, 1877.

[2] In October, 1859, a small frame battery of four stamps had been placed on the Carson River, near the foot of Gold Cañon, by two Californians, Hugh Logan and J. P. Holmes. The stamps were lifted by horse-power and crushed ore until the work was stopped by storms, for there was no mill building or shelter over the battery. This was unquestionably the first stamp battery brought across the Sierras, but it could only be called a mill by courtesy. (J. R. Logan, brother of Hugh Logan, and several old residents of Dayton, Nevada. The Big Bonanza, p. 69. Nevada Directory, 1863, J. W. Kelly, compiler.)

[3] Wm. H. Howland; testimony under oath; Sacramento Union, August 15, 1860.

This process was watched by Paul with natural anxiety. Failure had been so persistently predicted that his associates in the company had become disheartened, and he had resorted to entreaty, ridicule, and protest in order to induce them to hold to their contract. His pride and purse were alike staked on the issue of the trial. Accordingly, he awaited eagerly the report of the Virginia City assayers, Ruhling & Co. The five tons yielded $84.56 (gold, .954 fine, valued at $63.63; silver, .810 fine, valued at $20.93,) or an average return of $16.91 per ton. This product from refuse ore was accounted satisfactory, and he proceeded to crush and reduce ten tons of average rock from the same claim, which yielded in gold $387.02 and in silver $163.97—in all $550.99, or $55.07 per ton.

Interest in the work was then awakened throughout the camp. The Lucerne Company desired a test, and ten tons of selected quartz from their ledge produced $1,427.91, or $142.79 per ton. Joseph Plato sent down seven tons from his claim at Gold Hill and received a return of $449.60. The firm of Logan & Holmes, who had contracted with Paul to crush and reduce 4,000 tons from their claim, comprising the Gold Hill location of John Bishop and a portion of the Finney location adjacent, sent eighteen tons to the mill, which yielded $1,884.30, or $104.30 per ton in bullion.

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[1] J. W. Simonton, Corresponding Editor San Francisco Bulletin, September 20, 1860.

[2] Almarin B. Paul, San Francisco, Cal.

The secret of Paul's comparative success in reducing the ores of the new district lay in the fact that his tests were mainly with quartz which was far richer in gold than it was in silver. The Gold Hill ledges and spurs for many feet below the surface were rather gold-bearing than silver lodes, and as long as this relative proportion endured, even if the silver was mainly lost, a rich return in gold could be obtained from the ore. If he had attempted to reduce the rich sulphurets of the Ophir claim with his crude process, the results of his trials would not have proved satisfactory, but if the gold-bearing quartz could only be obtained in sufficient quantities, he had demonstrated the possibility of reducing it with profit to both miner and mill-man. As soon as this fact was made evident his batteries were kept in motion night and day. The little eight-stamp mill of Coover and Harris did equally satisfactory work, and the report of the results obtained spread through the camp and to San Francisco.[1] The Washoe Gold and Silver Mining Company No. 1 at once contracted for the building of another larger mill, of sixty-four stamps, at a point nearer Gold Hill. This contract was carried out with the same energy which had characterized the equipment of the first mill, and the new works were completed on the 4th of January, 1861, in ninety days from the signature of the contract, at a cost of $150,000.[2]

While these mills were building, some work which deserved the name of mining was in progress on several claims. The Ophir Mining Company, as soon as the development of their mine was delayed by the influx of water at the 50-foot level, transported from San Francisco a small steam-engine, indicated at 15 horse-power, the first on the lode. By the aid of this engine hoisting a tank fitted with a spindle-valve at its bottom their incline was continued along the dip of the ledge, while an adit was contracted for by the Mexican, California, Central, and Ophir companies to drain the ledge to the depth of 200 feet.[1] Work upon this adit, the "Union Tunnel," was begun June 8, 1860, and pushed night and day until, on October 17, 1860, the lode was cut in the claim of the Central Mining Company 155 feet below the surface.[2] This adit, 1,100 feet long, 4 feet wide, and 5½ feet high in the clear, was completed at a cost of $10,000, or $9 per foot, and was accounted a notable mining work in 1860. It was soon connected with the inclines, and the work of development on the ledge down to its level was considered an easy task, but the water was scarcely drained off when a second difficulty was encountered.

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[1] Territorial Enterprise, September 22, 1860.

[2] Almarin B. Paul, San Francisco, Cal.

At the 50-foot level the vein of black sulphurets was only 3 or 4 feet thick, and could be readily extracted through a drift along its line, propping up the walls and roof when necessary by simple uprights and capposts.[3] As the ledge descended the sulphuret vein grew broader until, at the depth of 175 feet, it was 65 feet in width, and the miners were at a loss how to proceed,[4] for the ore was so soft and crumbling that pillars could not be used to support the roof as in coal mines. They spliced timber together to hold up the caving ground; but these jointed props were too weak and ill supported to withstand the pressure upon them, and were constantly broken and thrown out of place.[5] The dilemma was a curious one. Surrounded by riches, they were yet unable to carry them off and their mass of black sulphurets bade fair to become a white elephant on their hands. The Ophir Company began to wish themselves less fortunate, as their miners narrowly escaped burial day after day in their attempts to stope out the ore.

A young mining engineer, Philip Deidesheimer, was in charge of a quartz mine in Georgetown, El Dorado County, Cal., in the autumn of 1860, when this serious check to the development of the lode occurred. At the request of William F. Babcock, a trustee of the Ophir Company, Mr. Deidesheimer left his California mine and crossed the mountains with a letter from the directors of the Ophir Company, authorizing him to inspect the workings of their mines and make such changes in the method of timbering as should seem to him expedient. After examining the vein he designed, in the course of a few weeks, a system of timbering which proved to be exactly adapted to the requirements of the work.[1] Experiments which he had previously made in California gravel and quartz mines furnished the outline of his plan. This was to frame timbers together in rectangular sets, each set being composed of a square base, placed horizontally, formed of four timbers, sills, and cross-pieces from 4 to 6 feet long, surmounted at the corners by four posts from 6 to 7 feet high, and capped by a frame-work similar to the base.[2] The cap-pieces forming the top of any set were at the same time the sills or base of the next set above. These sets could readily be extended to any required height and over any given area, forming a series of horizontal floors, built up from the bottom sets like the successive stories of a house. The spaces between the timbers were filled with waste rock or with wooden braces, forming a solid cube whenever the maximum degree of firmness was desired.

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[1] San Francisco Evening Bulletin, June 14, 1860.

[2] San Francisco Evening Bulletin, October 24, 1860.

[3] Sacramento Union, December 12, 1859.

[4] San Francisco Evening Bulletin, July 11, 1860; Philip Deidesheimer, Superintendent Hale & Norcross S. M. Company, 1880.

[5] William Wright, Big Bonanza. p. 135.

By adjustments of these sets the ore bodies along the line of the lode were extracted with comparative ease and security. The early appliances for removing the ore and waste rock were of the simplest kind. The Ophir engine could pull a small iron car loaded with the rock up the incline; but in other mines the rock was raised to the surface in buckets through the shafts by means of a rope and windlass, or carried out through the adits in hand-cars, pushed by miners over a tramway or wooden flooring. In the Mexican mine even hand-cars and buckets were not made use of, but the rock was conveyed to the surface in raw-hide sacks, bound with a strap over the forehead.[3]

When miners were employed by the different companies in the district, they were commonly expert men, trained in the mines of England, California, or Mexico; but in the numerous claims worked by the original locators any man who was strong enough to wield a pick was accounted competent to sink a shaft or cut an adit. Hence in many workings the sides or roof were frequently caving in upon the inexperienced laborers, sometimes with fatal effect; or, again, the adits missed the line of the ledge in view, and the drifts and cross-cuts were crooked and ill-ventilated. When two partners disagreed in regard to the best method of developing their prospective vein, as was often the case, work begun on a given line by one shift of men would be abandoned shortly afterward by the next shift, who would open their cut in a new direction. Some claims were harmoniously and systematically worked, but the great majority were opened to suit the notions of individual owners, and work was suspended or pushed in accordance with the feeling of the hour. The kindly provision of the Gold Hill district laws (article 4, section 16), which allowed a locator to hold a quartz claim for eighteen months after performing $15 of work upon it, had been modified indeed by a code adopted September 14, 1859, to govern the development of the mountain basin lying immediately north of Gold Hill.

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[1] Philip Deidesheimer.

[2] U. S. Geological Exploration of 40th Parallel, vol. III, Mining Industry, pp. 112, 113.

[3] Philip Deidesheimer.

VIRGINIA MINING DISTRICT LAWS.

ARTICLE 1. All quartz claims hereafter located shall be 200 feet on the lead, including all its dips and angles.

ART. 2. All discoverers of new quartz veins shall be entitled to an additional claim for discovery.

ART. 3. All claims shall be designated by stakes and notices at each corner.

ART. 4. All quartz claims shall be worked to the amount of $10, or three days' work per month to each claim, and the owner can work to the amount of $40 as soon after the location of the claim as he may select, which amount being worked shall exempt him from working on said claim for six months thereafter.

ART. 5. All quartz claims shall be designated and known by a name and in sections.

ART. 6. All claims shall be properly recorded within ten days from the time of location.

ART. 7. All claims recorded in the Gold Hill record and lying in Virginia District shall be recorded, free of charge, in the record of Virginia District upon the presentation of a certificate from the Recorder of Gold Hill District, certifying that said claims have been duly recorded in said district; and said claims shall be recorded within thirty days after the passage of this article.

ART. 8. (Stricken out by the meeting.)

ART. 9. Surface and hill claims shall be 100 feet square and be designated by stakes and notices at each corner.

ART. 10. All ravine and gulch claims shall be 100 feet in length, and in width extend from bank to bank, and be designated by a stake and notice at each end.

ART. 11. All claims shall be worked within ten days after water can be had sufficient to work said claims.

ART. 12. All ravine, gulch, and surface claims shall be recorded within ten days after location.

ART. 13. All claims not worked according to the laws of this District shall be forfeited and subject to re-location.

ART. 14. There shall be a Recorder elected to hold his office for the term of twelve months, who shall be entitled to the sum of 50 cents for each claim located and recorded.

ART. 15. The Recorder shall keep a book with all the laws of this District written therein, which shall at all times be subject to the inspection of the miners of said District, and he is furthermore required to post in two conspicuous places a copy of the laws of said District.

On motion it was

Resolved, That these laws be published in the Territorial Enterprise for one month.

Resolved, That W. C. Campbell be declared the Recorder of this District.

W. C. CAMPBELL, *Chairman.*
S. McFADDEN, *Sec'y.*

VIRGINIA, *Sept. 14, 1859.*

But the requirement of three days' work per month was clearly inadequate, and even this lenient requisition was evaded without difficulty, for a locator was suffered to hold his claim if a witness would testify to seeing him at work upon it on three days in the month, and a few moments of labor each day would enable him to obtain such a certificate. So easy of evasion were the specifications of Article 4, and so inefficient were the provisions for their enforcement, that it is doubtful if the penalty of forfeiture for non-compliance with the laws was ever inflicted, though the violations were legion.

Yet, although the development of the mines was left to the discretion of the owners, the natural restlessness and energy of the hybrid Yankee temperament pressed on the work, unsystematically, it is true, but eagerly and rapidly in all promising claims. Along the supposed line of the Comstock ledge, at least, the openings of shafts and adits dotted the surface like holes in a rabbit-warren. In the galleries of the Mexican mine the men drilled with long bars, spitting frequently in the hole with a peculiar hiss.[1] North and south of this claim for many hundred feet the tapping of picks and the report of blasts were heard from daybreak till sundown, and in some instances the work was kept up through the night.

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[1] Philip Deidesheimer, Superintendent Hale & Norcross Mining Company, Virginia City, Nev.

The working miners had few pleasures except the unfailing resources of gambling and drinking. Prostitution flourished, as in all large camps, and courtesans promenaded the streets slowly, decked out in gay dresses and showy jewelry, and drifting about with the restless tide which set to and fro through the city. Saloons of all descriptions, from the spacious rooms furnished with walnut counters, massive mirrors, and glittering rows of decanters to the cheap pine bar with its few black bottles, were to be found on every street and lane corner. Each had its special set of customers besides the chance passers-by who visited all indifferently. Men of different nationaltities, working side by side under-ground, here first exhibited a clannish disposition: the Italians had their favorite meeting place; the French their "Café de Paris;" the Germans their beer-cellars.[1] The Mexican miners, fonder than others of holidays, honored their patron saints by striking work and getting drunk on various anniversaries, and commemorated the declaration of their national independence by an illumination at the mine. Torches were ranged on a fence built about the mine works and on a flag-pole within the boundary. At sunset they were lighted, with an accompaniment of cheers and an anvil chorus which echoed from the hill-side down the ravines.[2] When this fiery rampart was in full glow its admiring builders watched the flames through the night until their eyes were closed by weariness and "rifle whisky."

On the 29th of September, 1860, the first theatre in the camp was opened by a traveling company from Salt Lake City, playing the farces of Toodles and Swiss Swains,[3] and though the fancy of the audience was mightily strained to supply the requisite stage-setting and the "star" was of the tenth magnitude, the performance was a pecuniary success, as the miners were disposed to accept a display of zeal in place of talent. Perhaps for the same reason they "loaded the hat" of the first missionary preacher[4] with silver when he stepped down from the dry-goods box which had served as his pulpit. Among prospectors faith without works was neither dead nor unappreciated; still, works were by no means lacking.

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[1] Sacramento Union, October 1, 1860.

[2] Sacramento Union, September 20, 1860.

[3] Sacramento Union, October 1, 1860.

[4] Rev. Adam Bland, of the Methodist Episcopal Church.—Church Records furnished O. D. Wheeler, U. S. Census Agent, Virginia City, Nev.

The disorderly camp was fast crystallizing into a well-established mining town.

The canvas tents and hovels had been replaced during the summer by board cabins and business houses, which were erected with surprising rapidity on the hill-side along the line of the ledge croppings. Yet the price of land and lumber was preposterous. Lots within the limits of the camp were sold in March, 1860, at from $200 to $1,000, though no valid title could be given with the property, and lumber was then $175 per M.[1] During the next month the price of lumber went up to $300 per M, as teamsters were charging $200 for hauling a load to camp, 18 miles from the mills in the valley,[2] and town lots 25 by 100 feet were held at from $700 to $1,500,[3] but even these exorbitant rates did not retard the growth of the town, for houses were purchased as rapidly as contractors could build them, and when the price of lumber fell to $80 per M, upon the completion of a good wagon-road through Gold Cañon, there was a general substitution of wood for canvas throughout the camp.

On October, 13, 1860, there were nearly one hundred buildings of different kinds in course of erection, and besides an uncounted number of cabins the following business quarters had been already built and occupied: 38 stores, general merchandise, 4 cigar and tobacco stores, 3 druggists' stores, 2 stationer's stores, 2 fruit stores, 25 saloons, 9 restaurants, 7 boarding houses, 1 hotel (the International), 4 butchers' shops, 9 bakers' shops, 7 blacksmiths' shops, 3 tinsmiths' shops, 1 gunsmith's shop, 7 shoemakers' and cobblers' shops, 1 saddler's shop, 2 carpenter shops, 1 paint shop, 1 tailor, 3 watchmakers, 2 barbers, 6 physicians' offices, 1 cians' offices, 1 dentist, 8 law offices, 2 express offices, 2 assay offices, 1 surveyor's office, 5 brokers' offices (agents and brokers), 1 auction and commission house, 1 dressmaker's shop, 4 machine-sewers' rooms, 10 livery stables and feedstores, 10 laundries, 1 bath-house, 1 theatre, 1 music hall, 1 school-house, 1 post office, 9 quartz mills, 5 lumber yards.[4]

The outlay required to erect these buildings, however large, was justified by the tariff of rents and lodging charges. Bunks with hay beds were let at $1 per night or $4.50 per week, and the favorite lodging-house known as the "Astor" had eighteen bunks in one room 20 feet by 12.[1] In April $125 per month was paid for the privilege of a cigar-stand in the corner of a store, and from $150 to $250 per month for a cotton-covered warehouse 20 feet square, without window, fire-place, or chimney.[2]

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[1] Sacramento Union, March 17, 1860.

[2] San Francisco Evening Bulletin, April 23, 1860; Editorial Correspondence, J. W. Simonton, Carson City.

[3] Sacramento Union, April 25, 1860.

[4] San Francisco Evening Bulletin, October 17, 1860; Virginia City Correspondent.

As the cost of building was offset by the rent-rates, so again these rates were overbalanced by the profits upon the sale of goods. The price of flour per pound rose from 20 cents, in March,[3] to $1, in April,[4] the wholesale price being $60 per 100 pounds. Sugar (brown) was sold at 50 cents per pound;[4] rice at 45 cents per pound;[4] butter at $1 per pound;[4] beans (white) at 40 cents per pound;[4] dried apples at 45 cents per pound;[4] bacon at 40 cents per pound;[3] codfish at 37½ cents per pound;[4] blankets at $8 per pair;[5] candles (by the box) at $1 per pound;[5] tin plates at $9 per dozen;[5] nails at $1 per pound;[5] shovels at $9;[5] liquors at from $12 to $20 per gallon and 25 and 50 cents per glass.[5]

The cost of food for the horses and mules was proportionally greater, as the supply was still less sufficient. Hay was doled out by the pound at 50 cents,[6] and barley was eagerly purchased at $1 per pound.[7] When neither could be procured, as was often the case, the starving animals died by scores on the road and at the camp. As the snow melted and the roads became passable for wagons, supplies of all kinds poured into camp so rapidly that prices fell in some instances to one-twelfth of their former rate, but when the first snow-storm, on the 19th of October, heralded the approach of winter, an advance was again noted. Freight charges from Sacramento ranged from 10 to 12 cents per pound; the price of flour rose to 14 cents per pound, and the cost of other staple groceries in proportion. Barley was sold at 12½ cents per pound and hay at $100 per ton.[8]

In a camp where the cost of living was so great wages were necessarily high. The wages paid to skilled laborers per day were, viz: Masons, $8; carpenters, $6; tinsmiths, $5; house-painters, $4; boot and shoemakers, $5. Common laborers received $4 per day, cooks from $50 to $100 per month, and waiters from $40 to $60. The usual wages of miners were from $4 to $5 per day, and mill hands received from $4 to $6.[1] Much of the early mining work was done by contract, the profits of the miners varying, of course, with the character of rock encountered. The usual price paid per foot of linear excavation in ordinary drifts or adits (4½ by 6½ feet in the clear) was $5.[2] Powder, fuse, and drills were furnished by the workmen, but the requisite timbering was commonly supplied by the employers.

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[1] San Francisco Evening Bulletin, March 16, 1860; Virginia City correspondence.

[2] Sacramento Union, April 17, 1860; Editorial. San Francisco Evening Bulletin, April 25, 1860; Editorial.

[3] Sacramento Union, March 17, 1860.

[4] San Francisco Evening Bulletin, April 13, 1860.

[5] John L. Moore, Virginia City, Nev.

[6] Sacramento Union, April 25, 1860.

[7] Sacramento Union, April 17, 1860; Editorial; John L. Moore, Virginia City, Nev.

[8] San Francisco Evening Bulletin, October 27, 1860.

With the approach of winter the needy, floating population of the camp had found regular employment or drifted away to other districts. How numerous a troop had flocked to the mines during the spring and summer cannot be exactly stated. A careful enumeration by a competent census agent toward the close of the year determined the population of Virginia City to be 2,244; of Gold Hill, 600; and of Silver City, a little town on the line of Gold Cañon, three miles from its head, 594.[3]

This record was without doubt substantially correct, though it did not accord with the extravagant estimates of the new-fledged citizens. The incessant stir and excitement of the time magnified the true proportions of the camps, and the total immigration was sometimes confounded also with the total population, though differing as widely as a running stream from a pool. Yet in this little colony the future city was foreshown far more distinctly than in the numerous swarms of prospectors which had covered the district during the summer. The growth of several of the little settlements in the valley of the Carson almost kept pace, also, with the rise of the towns on the lode. Dayton, at the foot of Gold Cañon, became in one summer (1860) a thriving village; Genoa, at the foot of the main pass leading over the Sierras, was the natural depot of supplies; and Carson, the county seat, on the banks of the river, near the centre of the valley, claimed the honors of a metropolis.

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[1] San Francisco Evening Bulletin, October 27, 1860; Washoe Correspondent "Pioneer," Virginia City, October 23, 1860.

[2] P. McMurchy, Contractor for Caledonia Tunnel, Virginia City, Nev.

[3] Territorial Enterprise, November 10, 1860; Report of Census Marshal for Western Utah.

CHAPTER VI.

THE INEVITABLE LITIGATION.

The desultory explorations of the past year (1860) were mainly serviceable in proving conclusively that organization and capital were essential to the profitable development of the great body of claims in the district. Informal associations with no strong ties of union and no means of insuring persistent work or equal apportionment of expenses were clearly ineffective. To supply this recognized need mine owners began to unite as incorporated companies. By this plan of organization the work of mine development was placed in charge of a single executive, presumably a competent superintendent, and a general oversight regulating expenditures and the conduct of the business of the company was provided for in the election of a board of trustees or directors. The necessary funds for carrying on the work were supplied by the levy of assessments or by the sale of reserved shares of the capital stock. The Ophir Mining Company was the first to organize in this manner, as has been noted, on the 28th of April, 1860, with a nominal capital of $5,040,000, represented by 16,800 shares whose par value was $300. Other associations followed suit in quick succession, and the most promising claims in the Washoe district, with few exceptions, were soon owned and controlled by stock companies.

During the early existence of the mining camp, while prospectors were chiefly occupied in staking off claims, no serious controversy had arisen, though individual bickerings over location boundaries were of daily occurrence. One claim appeared as good as another to most of these inexperienced silver ledge hunters, and there was no strong incentive to wrangle over rock croppings whose value was problematical; but before the close of the year 1860 work upon the principal claims had reached a point where collision was inevitable, and then the geological character of the district and the distribution of the ore deposits became a problem of absorbing interest.

The rugged slope of Mount Davidson and the irregular basin at its foot showed plain marks of violent eruptive movements and land-slides. A solid cone of dark-gray diorite[1] had been forced upward through overlying masses of feldspathic rock, splitting off huge parallel plates or layers by vertical and lateral pressure. This cone was the Sun Peak, and in later ages the plates about its base had slipped, or "faulted" in technical wording, while seething waters enveloped the grinding surfaces of the rocks and hissed through every fissure and tiny crevice. Hot sulphurous fumes rose through the weltering mass, and tossing clouds of steam and mineral vapors covered the basin. By the combined action of the thermal heat, motion, pressure, and solvent waters the crystals of feldspar were crushed and reduced to their constituent quartz and clay. That the precious metals were distributed in solution through the quartz and shattered porphyry by intermingling streams is generally conceded, but whether these metals were originally derived from hornblende decomposed by solfataric action or from other more remote sources has not been finally determined.

The mechanical disposition of the quartz bodies was, however, the question of immediate importance in 1860. Were they thrown into the form of narrow veins, separated by well-defined walls of barren rock; or were they deposited mainly in one great fissure, filled with immense fragments or wedges of porphyry, yet still a single lode, extending along the foot of Mount Davidson, bounded on the west by a sloping wall of diorite and clinging masses of porphyry and on the east by an irregular barrier of eruptive rocks and clays? In a word, were there many ledges on the slopes of Mount Davidson, or only one? When it is recalled to mind how many locations had been made in this basin and on the confining hills, and how many different ledges had been assumed to exist, it can be realized how much was staked upon the answer to this simple question.

By the law of the miners[2] the first locators were entitled to the exclusive possession of the section of the ledge included in their claims, with all its spurs and angles throughout its whole extent, or as far below the surface as they and their assignees were disposed to develop it. Planes drawn perpendicularly through boundary lines running at right angles with the general strike of the ledge as determined by survey marked the separation of the different claims. If, then, there was only one ledge, and the croppings on each side of it were adjudged to be spurs and angles instead of distinct bodies, the locators along the line of that one ledge were the lawful possessors of the ore deposits throughout the whole basin and eastern hill slope. If Comstock and his partners were the first locators on that ledge, for instance, a section 1,500 feet long and extending indefinitely downward was the undoubted property of these locators or their assignees, and the adjacent claims to the east and west were invalid. It is true that a claim of such proportions was not at first contemplated or tenable and locators on parallel croppings would have esteemed it too preposterous for serious answer. Comstock and his partners did not doubt the existence of parallel ledges, and their assignees, the Ophir Company, had been for many months in possession of their purchase before they conceived the idea of laying claim to the ownership of all the metalliferous deposits in the mountain side within the terminal planes of their location. But in the meantime, as their mine had been most largely productive, locations along its assumed line were the most highly valued, and were secured, as a rule, by organized companies of wealthy capitalists. These mine owners were few in number compared with those who had taken possession of claims on supposed parallel ledges, so that the majority were clearly interested in supporting the "many-ledge theory," as it was popularly termed. On the other hand, the claims on the line of the Comstock ledge were held by well-organized companies, while the parallel ledges were held commonly by the poor prospectors, who were the original locators, or by their assignee brokers. In the legal conflict which was to begin, aside from the weight of evidence, the chances of success were manifestly in favor of the side which was able to present its theory most forcibly and persistently; or, in other words, the side best able to employ competent counsel and to defray the expenses of protracted litigation. Still the facts presented in evidence at first threatened to offset this advantage by their apparent support of the popular theory. The croppings scattered over the basin were obviously separated by intervals of barren rock, and though the width of the ledges increased as their lines were traced below the surface, the parallel quartz bodies still remained distinct in most instances. No shaft or incline had been sunk in the autumn of 1860 deeper than 200 feet, and the question of the final union of the ledges at some undefined distance below the surface was undetermined. The evidence so far developed furnished a plausible basis, at least, for the maintenance of the "many ledge" proposition.[1]

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[1] A rock granitic in structure, but classed as diorite from the presence of distinctive crystals of hornblende.

[2] Mining laws, Gold Hill District, article 4, section 13; Virginia District, article 1.

The ledges lying to the east of the assumed Comstock line were in fact almost universally believed to be distinct from that lode, as its apparent dip was toward the west, in the direction of the diorite mountain, and receding from the basin ledges with each foot of its inclination. Melville Atwood, an old Californian assayer and practical geologist, in a letter written to the Ophir Mining Company in 1859, had indeed pointed out the fact that this apparent dip was a false one, and that the ledge would be found to turn toward the east, following the trend of the mountain slope, at no great distance under ground;[2] but little attention was paid to his prediction. A few others,[3] from independent observation, arrived at the same conclusion, but until the actual change of course was practically demonstrated the general opinion was that the westward dip indicated the true course of the ledge. Now this false dip, while going far to confirm the title of the locators on the eastern ledges, was the immediate cause of litigation with claimants whose location lay to the west, for inclines could not be sunk along the dip of the Comstock ledge without meeting corresponding shafts on the western ledges unless it should happen that the angle of inclination of these ledges was equal or less. As a matter of fact these ledges or spurs were nearly perpendicular in most instances, and one, the Virginia ledge, whose croppings were most distinctly marked, would be shown to dip unmistakably to the east.[4] Therefore as soon as any ore of value should be taken from these ledges the question of title would, of a certainty, be raised. A party of miners, holding the "Middle

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[1] *Vide* Sacramento Union, October 8, 1860, and Territorial Enterprise, April 2, 1863, for Editorial Articles in support of this assumption, as well as the list of Ledges, Virginia Mining District, in Nevada Directory, 1863.

[2] Sacramento Union, November 10, 1859.

[3] I. L. James; Philip Deidesheimer; William M. Stewart.

[4] Philip Deidesheimer; Wm. M. Stewart; I. E. James.

Lead," as it was termed, lying to the west of the Ophir Company's ground, was the first to develop a rich ore body,[1] and the deposit was at once claimed by the Ophir and Mexican companies.[2]

John Cradlebaugh, a pioneer lawyer, who had headed a little company in the recent Indian war, had been appointed Judge of the 2d Judicial District, Utah Territory, by President Buchanan, in 1859, and opened court at Genoa, Carson Valley, on September 3, 1860,[3] in the only available room, a badly lighted chamber, over a livery stable.[4] The town was filled to overflowing with lawyers, litigants, witnesses, and jurors. A bundle of straw in a barn was eagerly sought as a bed, and the judge slept contentedly between rival attorneys, while the humbler attendants spread their blankets on the sage-brush.[5] Excitement over the "Middle Lead Case" and other pending suits was at fever heat, and more than one shot was fired at an important witness as he galloped down Gold Cañon, at night-fall, to attend court on the following morning.[6]

When the case of the Ophir Company *vs.* McCall *et al.*, popularly known as the "Middle Lead Boys," was called, three or four hundred men, armed to the teeth, were present at the trial. William M. Stewart and Alexander Baldwin were the counsel for the plaintiff, the Ophir Company, while David S. Terry and James Hardy appeared for the defendants. The room was crowded with excited partisans, and an unguarded expression might at any moment bring on a collision which would cover the floor with bleeding bodies. The lawyers engaged in the suit being fully aware of the disposition of their respective supporters, exercised a judicious caution in discussing the merits of the rival claims, and they were markedly courteous in their personal allusions as well as in the examination of the witnesses, while their show of deference for the rulings of the court was extremely flattering to the presiding judge.[7] In the face of this prevailing harmony, the jury appeared unnaturally obdurate in persistently refusing to agree upon a verdict.

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[1] William P. Dewey, Secretary Ophir Mining Company, 1860; William M. Stewart.

[2] Sacramento Union, September 19, 1860.

[3] Sacramento Union, September 18, 1860.

[4] Territorial Enterprise, June 13, 1872, "Historical Reminiscences."

[5] Wm. P. Dewey; Isaac E. James; Wm. M. Stewart.

[6] Wm. P. Dewey, Secretary Ophir Mining Company, 1860.

[7] William M. Stewart.

The next case of interest on the docket was the suit brought by the Savage Mining Company (unorganized) to recover possession of ground on their claim held by a party calling themselves the Bowers Company.[1] The Savage Company held their claim by virtue of a location made and recorded July 4, 1859,[2] as follows:

NOTICE

That we the undersign claim Six claims Eighteen hundred feet on the Surposed Quarts Vein of Penrods & Co commencing at G Norrow cross claim & running north to Abe Fields & companys claim[3]

R CRALE
C CHASE
H CARMACK
W SURTEVANT
A O SAVAGE
L C SAVAGE

JULY 4th 1859
Recorded this day
V. A. HOUSEWORTH
Recorder

The Bowers Company had located their claim in May, 1859, as they alleged, and recorded it on July 2, 1859.[4]

NOTICE

That we the undersign claim Six hundred feet two claims commencing South line of Gould & Curry liying west of Curry & Co Including Quarts & Surface two hundred feet square running up the hill from Curry claim
21st May 1859

J. F. ROGERS.
T S BOWERS
JOS WEBB
G. A. HAMMACK

Recorded July 2, 1859[5]

V A HOUSEWORTH *Recorder*

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[1] Minute Book, Second Judicial District, Utah Territory, p. 82.

[2] Sacramento Union, September 19, 1860.

[3] Gold Hill Mining Records, Book A, p. 21.

[4] Sacramento Union October 13, 1860.

[5] Gold Hill Mining Records, Book A, p. 18.

For a time the two companies worked on the disputed claim, at intervals, without collision, but in April, 1860, the Bowers Company, thinking that their rights were infringed upon, built a rude stone fort on the ground, laid in a stock of provisions and ammunition, and a garrison of thirty armed men defied dislodgment.[1] Since that time they had held possession of the disputed ground, and the Savage Mining Company, in order to recover it, brought a suit against them for trespass. By consent of the contesting parties in open court,[2] as no unbiased jury could be impaneled and unanimous agreement was hopeless, a majority verdict was to decide the suit. The correspondent of the San Francisco Bulletin reported that the weight of evidence was overwhelmingly in favor of the plaintiffs, but the jury, notwithstanding, returned a verdict for the defendants[3] by a vote of eight to three. Subsequently, one of the jurors made affidavit that his decision was bought for the sum of $250 and a portion of the ground in dispute;[4] whereupon the counsel for the plaintiffs moved that a new trial be granted, but the motion was overruled October 20, 1860, "the Court viewing the case as only settling a matter of trespass,"[5] and not the ownership of any ledge or ledges within the location lines.

The issue of these two trials was a plain indication of the troubled scenes which were to follow. The rival ledge theories were a prolific source of contention, while the ignorant or intentional inaccuracy in defining the boundaries of the claims, and the neglect to make proper records or to record locations at all, were equally certain to result in expensive litigation. It was no wonder that lawyers flocked to Washoe, for the promise of a rich harvest was unmistakable.

As if to add to the confusion the President, James Buchanan, saw fit to remove Judge Cradlebaugh in January, 1861, from the bench, and to appoint in his stead a former minister to the Hague, R. P. Flenniken.[6] Now the act of Congress organizing the Territory of Utah provided that its judiciary should be composed of a chief justice and two associate justices of the supreme court, who should act also as district judges, upon their appointment by the President by and with the advice and consent of the Senate. Their term of office was limited to four years, but no provision was made for their removal by the appointing power, though another clause of the same act expressly empowered the President to remove the Territorial governor, secretary, United States attorney, and marshal. In commenting upon the tenure of the judicial offices Judge Crosby writes that, "as the freedom of the judiciary from the interference of political or other improper influence is a foundation-stone of our theory of constitutional government, it was evidently the intention of Congress to prevent removals of judges and to place them during the term of their commissions, as far as possible, on the same footing with the United States judges in the States, liable only to removal in the same way—by impeachment and trial for misconduct in office."[1] If the judge is right in his surmise, and this was the implied intention of the act, it does not follow by any means that the President was bound to conform to the will of Congress in thus arbitrarily hampering the executive powers confided to him by the Constitution. The tenure of the Supreme Court judiciary is fixed by the Constitution, but in default of any constitutional provision determining the tenure of Territorial judgeships it can scarcely be maintained that their incumbents are not on the same footing as the marshals and other appointees of the Executive. Judge Cradlebaugh, however, was naturally inclined to defend his seat, and sturdily refused to recognize the authority by which he was removed.[2]

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[1] Sacramento Union, May 8, 1860; Special Correspondent in Virginia City, April 28, 1860.

[2] Minute Book, Utah Ter., Second District, p. 82.

[3] Minute Book, Second Judicial District, Utah Ter., p. 82.

[4] San Francisco Evening Bulletin, October 2, 1860; Virginia City Correspondent, September 29, 1860.

[5] Minute Book, Second Judicial District, Utah Ter., p. 95.

[6] Territorial Enterprise, February 2, 1861.

On January 28, 1861, he opened court in Carson City and defined his position by a brief speech.[3] He gave notice that he intended to hold his seat on the bench, although Judge Flenniken had been appointed, confirmed, and assigned to the district, declaring that the President had no right to remove a judge, and that he for one did not propose to resign until the coming 4th of March. Furthermore, as the national Government had failed to honor his draft, drawn months ago, and his friend,

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[1] Henry R. Crosby, Associate Justice Supreme Court, Utah Ter., 1860; Letter dated March 8, 1881.

[2] William M. Stewart.

[3] Territorial Enterprise, February 2, 1861.

William M. Lent, had advanced money on his salary up to March 4, 1861, he considered that it was due to his creditor to serve his time out. If any attorney wished to withdraw his suit he would permit him to do so, in case answer had not yet been filed, but otherwise not, except by consent of counsel on both sides.[1]

In view of this laudable desire on the part of the judge to satisfy his creditor, and considering that he was probably better fitted to preside over Washoe trials than a new-comer unacquainted with the ways of the district, several of the leading lawyers agreed to try their cases before him until some decision upon his rightful tenure of office should be rendered by the supreme court of Utah.[2] A test case was accordingly appealed from his decision to the court at Salt Lake City, and pending the issue of this appeal[3] suits were brought to trial by William M. Stewart, David S. Terry, and others at Carson City. A few weeks later, however, as Mr. Terry considered that the charges of the judge accorded too closely with Mr. Stewart's views of the law and evidence, the temporary agreement was canceled,[4] and he announced his intention of recognizing the authority of Judge Flenniken, who had meanwhile arrived on the ground. This official was an elderly and somewhat pompous personage, who made his entry into Virginia City as if presenting himself at the court of Holland, and the fact of his wearing a fine silk hat, said to be the only one in western Utah, was the occasion of universal comment.[5] Stewart and the lawyers engaged to support the single ledge theory were satisfied with Cradlebaugh's decisions, and in no haste to transfer their allegiance to the new-comer, who was thought to be better adapted to adorn a foreign court than to deal with the complications of Washoe jurisprudence. Cradlebaugh, encouraged by the adherence of Stewart and others, held his ground firmly, and a conflict at once ensued.[6]

Two mining companies, the Rich and Lucy Ella, claimed a certain ledge on a hill near the Devil's Gate, Gold Cañon,[7] while a third association, the Saint Louis Company, was engaged in cutting an adit into the same ledge from a point two hundred feet below its croppings.[1] Some extremely rich ore had been found in the ledge, and on January 4, 1861, Judge Cradlebaugh granted an injunction, at the instance of the Saint Louis Company, restraining the Rich and Lucy Ella companies from mining on the ledge or carrying away ore from the disputed ground.[2] Before the process of the court had been served the Rich Company had ejected the Lucy Ella association by virtue of a peremptory order enforced by shotguns and revolvers,[3] but they in turn were formally dispossessed by the sheriff, who stationed a deputy on the ground to preserve the property intact until further order of the court. For some weeks the Rich Company submitted with a bad grace, but upon Judge Flenniken's arrival they erected a fort on the claim in spite of the protest of the deputy, and invited the Saint Louis Company to come and take it.[4]

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[1] San Francisco Evening Bulletin, February 8, 1861.

[2] William M. Stewart.

[3] A Washoe substitute for a writ of *quo warranto*.

[4] William M. Stewart.

[5] F. A. Tritle, Virginia City.

[6] Territorial Enterprise, November 24, 1860.

[7] Territorial Enterprise, January 5, 1861; San Francisco Evening Bulletin, January 10, 1861.

Mr. Stewart, as counsel for the Saint Louis Company, was by no means inclined to see the ledge despoiled, and obtained a warrant from Judge Cradlebaugh for the arrest of the garrison on the charge of violating the order of injunction; but he did not venture to place it in the hands of the sheriff, as Cradlebaugh's authority was so questionable that an attempt to dispossess the garrison was certain to result in bloodshed.[5] So matters stood on the evening of February 15, 1861, when the pony express brought the news from Salt Lake City that the supreme court had recognized Cradlebaugh as legally holding office notwithstanding the action of the President. Upon receipt of this report, and upon the urgent representations of Stewart and others, Judge Flenniken announced informally, in the presence of a large number of persons in Virginia City, that he should acquiesce in the decision, and the attorney for the Saint Louis Company was not slow to avail himself of this concession by delivering the order of arrest to John L. Blackburn, sheriff and district court marshal, with instructions to collect a posse and set out early on the next day to take possession of the fort at Devil's Gate.[6]

While the energetic lawyer was sleeping soundly the next morning, believing that the contest was over, a junior counsel in the suit entered his bed-room hastily and awoke him with the news that Judge Flenniken had changed his mind during the night and was publicly contradicting the report of his resignation. Stewart's disgust and alarm at this announcement were, as he says, unspeakable.[1] He knew that the Rich Company would be apprised of Flenniken's position and would, consequently, hold the fort against all comers and he was convinced that Blackburn, a resolute and reckless officer, would execute the order of arrest with his armed posse, in which event a desperate fight would ensue, for which he would be held responsible. If Flenniken persisted in his course, the order of Judge Cradlebaugh was possibly invalid, and the lawyer might be called to a bitter reckoning for his assumption of authority. With these thoughts in his mind he rose, dressed hastily, and went out in search of Flenniken whom he soon met in front of one of the many saloons. The judge greeted him blandly, with a dignified wave of the hand, but Stewart replied hotly, demanding his resignation at once, and his enlistment in a posse to assist the marshal in arresting the "jumpers" on the St. Louis claim. As he spoke he laid his hand heavily on Flenniken's shoulders. The amazed judge resisted slightly, but the impetuous deputy jerked him nearly off his feet into the gutter and repeated his order still more imperatively. Then Flenniken, recognizing the fact that he was a prisoner of war in a mining camp, accompanied Stewart meekly, though the latter still kept his hand on the judge's coat collar. The lawyer led his captive into the telegraph office where he dictated messages to Blackburn, to Grice, the marshal appointed by Flenniken, to Williams, the captain of the garrison, and to others, announcing the resignation of Flenniken in unmistakable terms, and ordering all persons to recognize the authority held by Blackburn. "Now sign these!" said Stewart, turning to Flenniken. The half-dazed judge obeyed. The lawyer tossed the parcel to the operator. "Send those telegrams and then keep away from that instrument for an hour or two!" The telegrams were soon dispatched to Silver City, the nearest point of communication with the fort, and replies were received an hour later announcing the surrender of the garrison. Nevertheless, the deputy kept watch and ward over the judge till Blackburn returned to Virginia City with his prisoners[1] and brought the crest-fallen garrison before Judge Cradlebaugh. Then Mr. Stewart made his appearance in court and represented to the judge that there had been, as his honor knew, a conflict of authority, and that doubtless the prisoners supposed themselves to have some sort of legal justification for the mistaken position which they occupied. In view, therefore, of the anomalous circumstances of the case, he hoped the Court would be lenient in its judgment and release the persons named in the warrant without imposing a penalty. Judge Cradlebaugh humanely consented, and the astonished prisoners were at once discharged.[2]

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[1] Territorial Enterprise, January 12, 1861; Sacramento Union, January 17, 1861.

[2] Mining and Scientific Press, January 18, 1861.

[3] William M. Stewart.

[4] Territorial Enterprise, February 16, 1861; Sacramento Union, February 21, 1861.

[5] William M. Stewart.

[6] William M. Stewart.

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[1] Wm. M. Stewart.

David S. Terry, the principal counsel for the Rich Company, had been unluckily absent in San Francisco during this decisive action, buf on his return, after viewing the field, he confessed defeat good humoredly in words which his opponent well remembers: "We were beaten deservedly by our own negligence, for we never should have trusted our general in the camp of the enemy. You had both commanders, and it is no wonder that our forces were routed; but it is too late now to grumble. The victory and the spoils are with you."[3]

Judge Flenniken made a slight attempt afterward to assert his authority, but his dispatches were in evidence against him, and he was scarcely willing to make known the full details of his impromptu resignation. It was currently believed that Mr. Stewart's persuasion had been very cogent, but a judge who could not maintain his own seat found few supporters in a mining camp, and he soon returned to the Eastern States with a deep-rooted distaste for mining-camp law and proceedings in equity. His rival thus held his seat undisputed, but as the validity of his tenure was extremely doubtful, to say the least, in spite of the Utah supreme court confirmation, legal proceedings were virtually at an end until the organization of the new Territory of Nevada by Act of Congress approved March 2, 1861, and the opening of district courts whose authority was unquestioned.

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[1] Territorial Enterprise, February 23, 1861; Sacramento Union, March 6, 1861.

[2] William M. Stewart.

[3] William M. Stewart.

CHAPTER VII.

CONSTRUCTIVE AND DISORGANIZING AGENCIES.

The report of the probable importance of the new mining region had influenced Congress to consent to the division of Utah and the formation of the new Territory. The chaotic state of the district was also known, and it was apprehended that the bitter feeling which existed between the newcomers and the Mormon council at Salt Lake City might induce the people of the district to revive the defunct State constitution and reinstall Governor Roop, or even to join the seceded Confederate States by an attempted dismemberment of Utah. To allay the prevailing discontent and bring order out of chaos the Territory of Nevada was created, and the territorial officers were assigned soon after to their respective stations.

The town of Virginia had been formally incorporated by an act of the Utah Legislature approved January 18, 1861, vesting the corporate powers and duties in a board of five trustees to hold office for the term of one year.[1] The first election of trustees was held accordingly on the 11th of March, 1861, when the lack of harmony among the people of the town was again made evident by the presence of nine sets of candidates in the field, though very little honor and no salary was attached to a position on the board. Many of the qualified citizens did not vote at all, but the five men whose names headed the poll-lists were declared to be duly elected, though no one received a majority of the total number of votes cast—1,200.[2]

When the first governor of the Territory, James W. Nye, arrived at the mines, therefore, on the 15th of July, 1861, the city of Virginia was prepared to receive him "with great pomp and ceremony."[3] The five trustees, escorted by the Virginia City brass band and the Virginia Union

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[1] Acts, Resolutions, and Memorials, Utah Legislative Assembly, Tenth Session, 1860–'61.

[2] San Francisco Evening Bulletin, March 12 and 15, 1861; Virginia City Correspondent.

[3] Sacramento Union, July 16, 1861; Virginia City Correspondent.

Guards, proceeded to the head of Gold Cañon, where they were met by the Gold Hill Guards, and the united pageant dazzled the eyes of the new magistrate as he ascended the steep hill leading up to the city. The band played "Hail to the Chief," the guards presented arms, the trustees rose up in their carriage with uncovered heads, and the populace cheered enthusiastically. The frog was very nearly a bull. The procession then moved back, marching through the principal streets and under a "splendid arch made by the ladies of the city," greeted by vociferous cheers and irregular salvos of "minute guns." At Union Square the governor was addressed in behalf of the city by the orator of the day, and replied amidst continued cheering. Then followed a "splendid dinner" at the International Hotel and unlimited speeches and toasts. Everything was "splendid" and the new metropolis admired itself duly. It was hoped that the day would pass without a flaw which should inform the governor that the customs of the city still savored of the mining camp, but the hope was disappointed. In a little colloquy before the windows of the International Hotel a citizen named Butler "made himself too prominent with his pistol." The deputy sheriff, John Williams, undertook the disagreeable duty of arresting him, when the usual impromptu Washoe duel took place.[1] Williams was the best marksman, for in less than a minute Butler received one ball in the side of his knee and one in his shoulder, while a third scraped his face roughly. Then he yielded, somewhat to the disgust of the lookers-on, who did not consider him entitled to withdraw on the score of being seriously wounded.

This salute could scarcely have been a surprise to the incoming governor, for he already knew well the troubled condition of his province. An orderly city does not crystallize out of a lawless mining camp in a day or a year. Moreover, the city charter was radically defective. The powers of the board of trustees were ill defined and feebly exercised. The police force and regulations in particular were totally inadequate and the main reliance of the citizens for protection was upon the United States marshal and his deputies, a few constables extraordinary. Williams was a good example of this irregular police, always ready to take part in a fight, but loath to spoil one by untimely interference. In default of any better method of settling a dispute, trial by combat was practically accepted as satisfactory to the general public, and when one of the combatants fell, the survivor was either permitted to leave the field unquestioned or arrested as a matter of form to satisfy the requirements of the law, for there was no prison in the city, and consignments to the county jail at Carson were simply farcical. Until November, 1861, this place of confinement was a little log shanty, standing among the principal drinking saloons,[1] from which, with slight help from confederates, or unassisted, criminals of ordinary activity escaped at will, and their recapture was rarely attempted. The conviction of a murderer by an ordinary jury was an anomaly, and capital punishment by process of law had never been inflicted in Carson County or the new Territory.[2] Still murders were commonly avenged in a rudely equitable fashion. Mining-camp justice demanded an eye for an eye, a tooth for a tooth, and the victor in a Washoe duel might expect to be killed himself by some comrade of his victim, who in turn would fall before the pistol of another. Thus originated a true vendetta, and the chain of avengers often had many links. Thirteen consecutive deaths growing out of one murder have been traced by a lawyer of Virginia City, and shorter chains are known to all Nevada pioneers.[3] In this way these human wolves considerately acted like Kilkenny cats, and the city was relieved by degrees of its incubus. The riddance was hastened by the action of fearless citizens whom a ruffian would occasionally attempt to bully. Of this class was Van Sickle, a ranchman of Carson Valley, who was attacked without provocation in his own house by the notorious Sam. Brown and forced to fly for his life, as he was without weapons, while Brown was armed in his usual fashion, carrying a knife in his bootleg and heavy pistols in his hip-pockets. On the night of the same day when he was driven from his home, July 6, 1861, Van Sickle lay in wait for Brown and shot him as coolly as he would have shot a prowling coyote. The ruffian was killed instantly, and the community agreed with the outspoken verdict of the coroner's jury at Genoa, justifying his executioner—"it served him right."[1]

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[1] Sacramento Union, July 16, 1861; Virginia City Correspondent.

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[1] Sacramento Union, December 1, 1861.

[2] Virginia City Union, September 5, 1863.

[3] See also Territorial Enterprise, April 9, 1871, "A Record of Blood."

By the organic act of the Territory the governor was empowered to appoint all county officers, and did what he could with this auxiliary staff to maintain order at the mines; but until the meeting of the legislative assembly and the final organization of the district courts he was unable to check effectively these ruffianly outbreaks. The reign of lawlessness culminated in the murder of John Blackburn, Territorial marshal under Judge Cradlebaugh, whose service in the contest of the Lucy Ella and St. Louis Mining Companies has been noted. The fearless acts of this officer made him particularly obnoxious to the desperadoes of the district, but he was so alert and well armed at all times that any attack upon him was a desperate venture; yet he was killed in the early evening (November 18, 1861), while standing in a well-lighted and crowded saloon of Carson City. He was not off his guard, for when a ruffian, William Mayfield, came through the crowd toward him, he scented danger, drew a pistol and would have foiled the attack, but his friends unaccountably interposed, and he was stabbed to the heart under their arms. With his last gasp he leveled his pistol, but fell dead before he could pull the trigger, his eyes burning with the passion of baffled vengeance. Mayfield flourished his bloody knife defiantly and made his escape from the room by the aid of confederates,[2] and though he was afterwards hunted down and arrested, he broke jail as a matter of course,[3] and fled to Montana, where he finally received his deserts in a drunken brawl.[4]

The murder of Blackburn, though not directly avenged, aroused such general indignation that the governor was strongly supported in his efforts to suppress the growth of ruffianism, and during the session of the first district court, closing March 15, 1862, a number of flagrant offenders were tried, convicted, and punished by fine and imprisonment.[5] A new jail was constructed in Carson County in November, 1861, to which the prisoners were transferred from the old and insecure hut. Through the new jail, built of adobe, a heavy beam extended, to which iron chains were bolted and used as shackles for the worst offenders.[1] Of the sixteen prisoners thus committed to the new jail nine were charged with the crime of murder.[2] It is certain that the number of criminals confined in jail was small compared with those suffered to go at large in the district, but more definite statistics cannot be obtained. Exact tabulated records are not, however, essential. For the purposes of this history it is sufficient to show how the surface current of lawlessness was intermixed with the forces which were steadily establishing the mining camps on a firm and stable basis. Of these constructive agents the development of the milling industry was the chief.

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[1] Sacramento Union, July 8, 1861; Virginia City Territorial Enterprise, July 13, 1861.

[2] Sacramento Union, November 23, 1861; Carson City Correspondent, November 18, 1861.

[3] Sacramento Union, December 1, 1862.

[4] Comstock Papers, No. 4, by Henry de Groot; Mining and Scientific Press, January 27, 1877.

[5] San Francisco Evening Bulletin, March 28, 1862; Virginia City Correspondent, March 21, 1862.

While the rival claimants were wrangling over the possession of the ledges and searching for ore with limited success, the profits gained by the early quartz mills and the reported richness and extent of the ore bodies excited a speculative mania which clogged the sierran passes with ponderous loads of engines and mill machinery and dotted the valley and cañon water-courses with rising buildings.[3]

The number of mills in process of erection was totally out of proportion to the quantity of ore so far shown to exist, but the builders were so anxious to share the known profits of the pioneer mill-men that their heads had no room for prudent estimates of supply and demand. Besides, they believed the boasts of the sanguine prospectors, most of whom could show samples of rock from their claims with assays of tempting richness. The ledges were only waiting to be crushed to yield up their precious contents, and the only bar to fortune was the inevitable delay in transporting the requisite machinery and mill supplies across the mountains and in putting the stamps in motion. Incited by competition and hope of gain the work was pushed with almost incredible rapidity in face of the attendant obstacles. The Californian foundries and machine shops were taxed to their utmost to keep pace with their multiplying orders, and hundreds of creaking wagons, burdened with their freight of iron, were dragged over the steep grades of the Sierras to the valleys beyond.[1] Foundations of roughly broken stone were hurriedly laid to support the machinery, and frames of timbers were hastily put together and covered with boards to serve as a shelter.[2] Lines of these flimsily-built structures extended along the Carson River and up the cañons wherever a thread of water flowed, and often where no water was to be had except during the spring months from melting snow-drifts on the neighboring hills. Seventy-six mills, running 1,153 stamps, with an estimated crushing capacity of 1,200 tons daily, were erected within a radius of 16 miles from the mines before the end of the year 1861, and twenty more were planned or building.[3]

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[1] Sacramento Union, December 1, 1861.

[2] Sacramento Union, December 1, 1861.

[3] Sacramento Union, July 15, 1861.

MILLS.	STAMPS.	COST.	COUNTY.
8	114	$200,000	Ormsby.
6	106	$1,200,000	Washoe.
40	573	$3,700,000	Storey.
22	360	$1,000,000	Lyon.

As fast as the machinery could be set in motion supplies of quartz were fed to the stamps and the mill-men were prepared to catch the powdered gold and silver in their rows of pans. Loads of rock had been brought at a heavy cost from distant ledges, and the claim locators watched for favorable returns as eagerly as the mill owners,[4] so that hundreds were disappointed when ton after ton was crushed only to reveal its hopeless barrenness or profitless scarcity of metal. Thus ten tons of selected quartz from the Calahula lode yielded in gold $197.25 and in silver $20.76, or an average per ton of $21.85; ten tons from the Poorman lode, near Silver City, $179 in gold and $38.32 in silver, or $21.63 per ton; eight tons from the Yellow Jacket "back lode," Gold Hill, $69.88 in gold and $18.84 in silver, or $11.80 per ton; and twenty tons from the Crown Point claim, $338.65 in gold and $61.36 in silver, or $20 per ton.[5]

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[1] Sacramento Union, July 17, 18, 19, 20, and 23, 1861; Trip to Washoe; Special Correspondent.

[2] Sacramento Union, November 7, 1861; Special Correspondent, Silver City, November 4, 1861.

[3] San Francisco Evening Bulletin, December 4, 1861; Gold Hill Correspondent, November 30, 1861. Henry de Groot, Census Marshal, Nevada Territory, 1861; "Pioneer Mills and Mill-Men," Mining and Scientific Press, February 10, 1877. "No less than seventy-six mills, carrying a total of 1,200 stamps and costing an aggregate of over $6,000,000, were finished and started by the end of 1861, and some forty or fifty arrastras and several patio yards were also built."

[4] Territorial Enterprise, July 13, 1861; San Francisco Evening Bulletin, July 17, 1861.

[5] Almarin B. Paul; San Francisco Evening Bulletin, March 21, April 4, 1863.

The return from the lode-claim of the "Sucker Company" was particularly disappointing, for this lode was a popular favorite, selling in 1860 as high as $130 per foot, and its owners confidently proclaimed their assurance that it would yield from $500 to $1,000 per ton. Five tons of selected quartz were sent to Paul's mill, and the return was made—of gold, $179.86, of silver, $22.27, or $40.50 per ton; but as the owners were not satisfied with this test, thirty-five tons of average quartz from the lode were crushed in the same mill with a product of gold, $629.85, silver, $64.90, or $18.58 per ton. To offset the damaging returns the managers of the company declared Paul's mill process a failure and sent a quantity of ore to San Francisco, where assays were obtained after the consignment had been "salted" with Californian gold, and Paul was confronted with the figures; but as the assays carelessly reported the value of the gold at $17 per oz., while the Washoe gold never exceeded $10 per oz. in value, he threatened to expose the swindle, and the managers concluded not to publish the re-assuring certificate.[1]

The product of rock from other claims was still less satisfactory, and it was apparent that comparatively few out of the thousands of claims located could be worked profitably while the mill charges were from $20 to $30 per ton. It was conclusively shown, also, that inaccurate or purposely exaggerated assays had been made, and that still more frequently fragments of ore had been picked from narrow seams and stringers inclosed in worthless porphyry and palmed off as fair samples of a continuous vein. Even when the ore bodies were large and rich enough to yield moderate returns, if skillfully worked, only a low percentage could be extracted by the crude methods of reduction generally employed. At least half of the mill owners were ignorant of their business and were forced to learn by watching their better-informed neighbors or in the costly school of original experiment. A century before, an observant Spanish critic had written, most pertinently:[2] "A class of men so necessary to the mining body as the amalgamators should be well educated, and should be subjected to an examination as the assayers are under our 75th Ordinance and as is the practice in the royal stores and the royal mints, notwithstanding that less experience is there required than in the business of an amalgamator or smelter—a business which takes a much larger range and calls for far more skill, and any carelessness in which may lead to irreparable mischief. For the task of bringing the silver to the proper point should not be intrusted to a mere ignorant blockhead." But the proposed requirement of evidence of competence from mill-men would have abridged the privilege of American citizens to waste the mineral resources of the public lands without hindrance. Moreover, the necessary expenses of reduction were so heavy that only quartz yielding a high average return could be worked at a profit. If the mills were built near the mines or in the cañons the supply of water was scanty and uncertain; or if along the winding course of the Carson, it was necessary to transport the ore in wagons from seven to twenty miles. For a time the stunted growth of nut-pines and cedar in the neighboring ravines could be used as fuel, but it was soon requisite to drag the firewood from distant points and even to cut it on the sierran slopes twenty miles from the mines. Salt, mercury, and other mill supplies were brought from California at a cost already stated, and the average wages of a mill-hand were from $4 to $6 per day. Under these disadvantages it is not surprising that the expected profits were not realized. The inexperience and want of foresight were so general that few even attempted to store up a supply of wood and quartz sufficient to keep their mills running during the winter, when the roads became impassable.[1] Hence, in January, 1862, of the numerous mills in the district only four or five were able to continue work, and even as late as April of the same year only twenty-three were actively employed.[2] As the season advanced others were furnished with quartz, rich, poor, and indifferent, and the clatter of stamps resounded day and night through the cañons and disturbed the dreams of the farmers in the valleys;[3] still there was at no time a sufficient supply of ore taken from the mines for the mills already built, and yet the fever of speculation was not abated till the end of the year (1862), when nearly one hundred mills were standing in the four counties of

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[1] Almarin B. Paul.

[2] Gamboa's Commentaries, Heathfield's Translation, vol. 2, p. 199.

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[1] San Francisco Evening Bulletin, December 21, 1861; Virginia City Correspondent, December 17, 1861.

[2] San Francisco Evening Bulletin, April 12, 1862; Virginia City Correspondent, April 9, 1862.

[3] Territorial Enterprise, March 15, May 18, 1862.

Washoe, Ormsby, Storey, and Lyon, one-fifth as many as in all the mining districts of California.[1] Most of these were of the simplest and rudest description, but the combined capacity was imposing and useless, for if the low estimate of twelve hundred tons per day be taken, this was fully three times as much as the mines were producing of milling ore, and the greater part of the mills must lie idle for half the year at least. Competition aggravated the evils of scarcity, for, as a fixed sum per ton was paid for milling, it was the interest of the custom-mills to reduce as many tons per day as possible, however imperfectly, in order to compete with one another at a profit. Guarantees of an arbitrary percentage of returns based on the assay value of the ore were rarely given, and unless the customer became disgusted at the scanty yield of bullion and withdrew his patronage the mill owner cared little for the constant waste of metal in the slimes and tailings, which were washed away directly or indirectly into the river.[2] Thus the Carson flowed, like the Pactolus, over precious sand, and its bed is lined with ore in layers of varying thickness. It is not too much to say that one-third of the ore product during the early years of mining on the lode was lost in the process of reduction through carelessness, ignorance, and reckless competition. Even when the mill-man was painstaking and scrupulous, or when he bought the ore from the mines outright, he was often unable to save a high percentage of its assay value, but this failure was the necessary accompaniment of the years of experiment through which a new process is perfected.

The use of heavy mullers and the application of steam as a means of heating the pulp had been made in the spring of 1860, as narrated in a previous chapter; but the pans of Brevoort and Woodworth were defective in important details. In 1860 Mr. William H. Howland changed the form of the Brevoort castings considerably, constructing a strong, serviceable working-pan five feet in diameter and twelve inches deep, with a muller and ring weighing from 600 to 700 pounds.[3] These pans were found to be efficient for the amalgamation of ores, but were not designed at first to be used as a substitute for the Mexican kettle. In the winter of 1860–'61, however, Mr. Howland (at the request of Mr. Henry P. Wakelee, a chemist of San Francisco, who was experimenting upon the reduction of silver ores in his laboratory in that city) contrived a flue or hollow iron chamber, which was fitted to the bottom of an iron pan and served as a funnel or chimney for the hot air and smoke of a stove placed beneath. Wakelee intended to heat the pulp, as in the cazo or kettle process, but it was found that the flue was liable to become choked with soot which collected on its sides. In accordance with a suggestion given by Mr. Almarin B. Paul, who was using a stove and pan of the same design in his Gold Hill mill, Mr. Howland substituted steam conducted through pipes into the hollow chamber beneath the pan, in place of the stove, and at once began to construct pans of this model.

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[1] San Francisco Evening Bulletin, October 30, 1862, Almarin B. Paul, Correspondent.

[2] *Vide* Territorial Enterprise, April 28, 1871; "Loss of Slimes and Tailings."

[3] William H. Howland, Almarin B. Paul.

Meanwhile ingenious mechanics of California had cudgeled their brains over pans of different devices, corresponding with mill-men at the Washoe mines and elsewhere, and trying one variation after another; but until Zenas Wheeler, in December, 1861, contrived a method of establishing a circulation of the pulp in the pan, no improvement of marked importance had been made. By the rotation of the muller the pulp was thrown from the centre of the pan toward the circumference, and Wheeler's object was to devise a plan by which the pulp might be thrown back toward the centre to be again ground between the faces of the revolving-shoes and dies. To deflect the current, therefore, he arranged curved plates extending from a frame at the centre of the pan to its circumference. The frame was supported on the upper end of the muller-shaft in such a manner that the plates would follow any adjustment of the muller and bear the same relation to it whether in its highest or lowest working position. The outer ends of the plates were supported by slides cast upon the inner surface of the pan. The effect of these plates was to counteract the centrifugal force generated by the rotation of the muller and to cause the pulp to pass toward the centre of the muller and down through the central opening, to be again forced outward between the muller and bed-plate. In January, 1862, drawings of Wheeler's pan were received at the Miners' Foundry at San Francisco, and the first working-model was constructed, though pans of this design were not put to practical use in a quartz-mill until June of that year. Their serviceability was quickly demonstrated, and the demand for them became so extensive that up to the close of the winter of 1863-'64 the Miners' Foundry manufactured on an average one per day.[1] This extraordinary popularity excited the jealousy of a rival inventor and gave rise to the noteworthy suit of Thomas Varney *vs.* Zenas Wheeler *et al.*, for alleged infringement of patent, before Judge Ogden Hoffman, in the United States Circuit Court for the Northern District of California.

In the trial of this case it was clearly set forth by Judge Hoffman that the employment of a grinding muller with a central opening rotating upon a fixed surface was not a novel invention and therefore not patentable. But the plea of infringement was mainly based on Varney's device of curved or spiral scrapers, arranged relatively with the upper surface of the rotating muller in such manner as to insure the movement of all heavy substances in the pulp. Varney had applied for a patent in 1861, which was issued December 16, 1862, a year before Wheeler obtained a patent for his pan (December 8, 1863), but the judge ruled that the Varney scrapers were merely modifications of previous devices used in the Knox and other pans to prevent the lodgment of lumps on the top of the muller, and that the curved plates of Wheeler differed from these scrapers in form, arrangement, object, and effect. It was shown in evidence also that Wheeler's muller shoes and dies differed materially from those designed by Varney in 1861, the surfaces of which were horizontal planes with radial grooves or slots, while the Wheeler pan shoes and dies were fashioned so that their faces met like the blades of a pair of shears, and spiral ridges on the muller were arranged to correspond with reverse ridges on the inner surface of the pan, in the design of raising the pulp and promoting circulation. As it was established, therefore, that in no patentable detail were the original Wheeler and Varney pans alike, Judge Hoffman had no hesitation in deciding in favor of the defendant, Wheeler.[2] The defendant had, indeed, far more reason to claim an infringement of his own patent by Varney, for the latter had discarded several of his original devices and supplied their place with working parts which differed very slightly from those invented by his rival.

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[1] Mining and Scientific Press, May 28, 1864.

[2] Thomas Varney *vs.* Zenas Wheeler *et al.*, United States Circuit Court for Northern District of California, 1864.

In the first Wheeler pans manufactured, steam was conducted into a hollow chamber beneath the pan substantially similar to the flue designed for the use of Mr. Wakelee, but in the summer of 1862 these pans were constructed with pipes admitting steam directly to the pulp. Wheeler's mullers and shoes were much heavier than any previously used, weighing from 2,100 to 2,200 pounds. The diameter of his pan was 4 feet and its depth 22 inches.[1] So complete and well adapted were the working parts of this pan that since its first introduction no radical changes have been made in its construction.

Hepburn and Peterson, in the summer of 1863,[2] began to manufacture a pan of original design, the bottom being an inverted cone, with dies affixed to the cone-shaped surface and mullers made to correspond. It was held that with pans of this model the pulp would fall toward the centre by natural gravitation, and a constant current would thus be obtained which would obviate all necessity for wings or scrapers. The grinding efficiency of the conical as contrasted with the flat-bottomed pan was theoretically as 1.3251 : 1.1852,[3] but a discrepancy was alleged to exist between the theoretical and the practical efficiency, occasioned to no little extent by the unsteady and swinging motion of the conical muller, whose greater base was upward; for the muller, wearing away at its greater circumference and then coming to bear almost entirely on its lower and smaller base, "seems to toss about and labor like a ship in a heavy sea, scarce making a knot toward the destined haven."[4]

Two years later Zenas Wheeler and P. M. Randall patented another pan, in which the grinding surfaces were tractory conoidal plates, alleged to be greatly superior in grinding properties to both plain circular and conical plates.[5] Schiele, a miller of Oldham, England, was said to have practically demonstrated this conclusion several years before, producing as much flour with a 2-foot runner of that design as with a 4-foot flat millstone. The relative grinding effects of the three forms of muller were computed to be, theoretically:[1] Plane or flat-bottomed, 1.1852; conical, 1.3251; tractory, 1.7778. The inventors claimed that the working efficiency of their pan was not inferior to its theoretical superiority, alleging that their pan (the Excelsior Grinder and Amalgamator) would reduce 177 tons of ore[2] to the same degree of fineness in the same length of time in which 98 tons could be reduced in the flat-bottomed pan and 115 tons in the conical pan. The conical and tractory pans are undoubtedly ingenious in design, and the claims of their inventors as to their grinding efficiency, compared with the flat-bottomed pan, are probably justified;[3] but in the opinion of many practical mill-men their use is attended by an excessive loss of mercury which is too finely divided by the action of the grinding surfaces. It is possible to have too thorough pulverization, as Gamboa noted when he wrote: "The first stirring and trampling (in the patio process) must be performed with care and gentleness lest the quicksilver should become too minutely divided and form 'lis,' which is the term applied when it separates into almost imperceptible particles."[4]

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[1] William H. Howland, San Francisco, Cal.

[2] Mining and Scientific Press, April 9, 1864.

[3] Mining and Scientific Press, May 19, 1866, June 17, 1866.

[4] P. M. Randall; Mining and Scientific Press, June 17, 1866.

[5] Mining and Scientific Press, July 1, 1865.

While these inventors were at work in California, time and money were expended lavishly in Nevada in trying and re-trying variations in the form and structure of the different pans. In this way the Washoe mills have been technical schools, by whose instruction the ore-reducing industry of the whole country has largely benefited, and the cost of the training, however large, is inconsiderable compared with its importance and value.

At the outset money was thrown away doubtless in useless experiments with so-called "secret" and humbug processes,[5] for not content with the results obtained by the careful use of mercury, salt, and sulphate of copper, all manner of mixtures, liquid and solid, were added to the pulp in the pans with a mysterious formality which matched the demeanor of the three weird sisters in compounding their hell-broth. Drugs with strange names were tried in allopathic and homeopathic doses—acids of all sorts were poured over the steaming mass—bark from the cedar trees and the native sage-brush was boiled to a strong decoction and the bitter tea administered to the patient pulp. A humorous observer remarked, with apparent truth, that the "object of many inventors of processes appeared to be to physic the silver out of the rock, or at least to make it so sick that it would be obliged to loose its hold upon the matrix and come out to be caught by the quicksilver lying in wait for it at the bottom of the pans."[1] Process peddlers hawked about their wares at high prices and mill superintendents dabbled with odorous chemicals in private laboratories. Some of the acid solutions cleansed the mercury of foreign impurities and in so far aided the process of amalgamation, but the value of the other compounds has never been detected.[2] Still these mummeries did not seriously interfere with the progress of the intelligent observations made by trained mill-men and inventive mechanics in perfecting the pan process, and were laughed away at length in the light of a broader experience and a general acquaintance with elementary chemical principles.

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[1] Mining and Scientific Press, May 19, 1866.

[2] Seventh Annual Circular (1866) of Miners' Foundry, San Francisco, p. 23.

[3] U. S. Geological Exploration of 40th parallel, vol. III; Mining Industry, p. 223.

[4] Gamboa's Commentaries, Heathfield's Translation, vol. II, p. 201.

[5] Almarin B. Paul; William Wright.

More money was wasted by the imprudent adoption of imperfect mechanical devices and unsuitable processes than was expended in the trial of humbugs. Mills were furnished with expensive machinery which failed upon trial to reduce ore cheaply or effectively and was of necessity discarded,[3] and money was lavishly expended also in the construction and equipment of mills belonging to wealthy mining corporations as if drawn from an inexhaustible treasury.[4]

The Ophir milling establishment, near Washoe Lake, 12 miles from the mines by road, covered fully an acre of ground. Besides the mill buildings proper—large and costly structures—the shops, stables, carriage-houses, quarters for workmen, offices, and superintendent's residence constituted a miniature city. Pasture-lands, grain-fields, and vegetable-gardens surrounded the hacienda, and two thousand acres of woodland on the neighboring hills belonged to the company.[1] In cutting and hauling wood, preparing lumber in the saw-mill, burning charcoal, and other outside duties nearly one hundred men were constantly engaged, while a still greater number were employed in the reducing-works. These works were built and equipped at extraordinary cost for the reduction of ore by the barrel or Freiburg and patio processes. In other districts both methods were well approved, but neither were suited to the requirements of the work at Washoe, for the high cost of labor and fuel and the charges for transporting the ore from the mines barred the employment of the barrel process, except in the reduction of high-grade ores, and owing to unfavorable climatic conditions and unskillful treatment the results obtained from the patio process were never satisfactory. Up to the 1st of April, 1862, 21,000 tons of ore had been quarried from the Ophir mine, but only a selected portion of 3,000 tons had been reduced. The bullion product was $980,000, yet only one-ninth of this sum had been paid to the stockholders as dividends. The official report is of interest:—

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[1] William Wright (Dan de Quille); Big Bonanza, p. 139.

[2] San Francisco Evening Bulletin, February 4, 1861; Almarin B. Paul, Silver City, January 31, 1861.

[3] Alpheus Bull, President Gould and Curry Silver Mining Company, 1864-'72.

[4] Henry de Groot; "Pioneer Mills and Mill-Men."

Amount received for ore and bars		$980,000
Amount expended on capital account	$300,000	
Amount expended for working expenses	559,200	
Amount paid for dividends	100,800	
Balance on hand	20,000	
		$980,000[2]

If the actual expense of delivering the 21,000 tons on the surface be reckoned at $7 per ton, a sum considered ample for this purpose, the extraordinary sum of $349,200 must have been paid for reduction of 3,000 tons, freight, and office expenses. When the original expense of the reduction-works is considered, amounting to more than two-thirds of the sum expended on capital account, it is evident that the Ophir mill was a costly experiment for the stockholders of the company.[3]

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[1] San Francisco Evening Bulletin, June 3, 1861, Washoe Correspondence; San Francisco Evening Bulletin, October 24 and 30, 1862; "Ophir Works," Letters of Almarin B. Paul; Pioneer Mills and Mill-Men, Henry de Groot; Comstock Papers, No. 17, Mining and Scientific Press, February 24, 1877.

[2] Official Report of Secretary of Ophir Mining Company, 1862; Sanborn's Weekly Stock Circular, April 5, 1862.

[3] *Vide* also Henry de Groot, "Pioneer Mills and Mill-Men," Mining and Scientific Press, February 10, 1877.

The extraordinary mill of the Gould & Curry Company was, however, the most conspicuous monument of inexperience and extravagance ever erected in a mining district. A rocky point two miles east of Virginia City, at the junction of Six and Seven-Mile cañons, was transformed into an artificial plateau,[1] on which was erected a building in the form of the Greek cross, 250 feet long, with arms 75 feet in length and 50 feet in width. The lower story and foundations were constructed of massive stone blocks supporting a heavy frame superstructure of finished wood, adorned with broad verandas, and painted inside and out.[2] Smooth approaches were cut out and blasted over the hill-sides, arched sewers were built of hewn stone, and graded terraces, ascended by flights of broad stone steps, surrounded the mill. On the summit of the hill above the plateau a large reservoir was excavated in the solid rock and supplied with water from Virginia City, from which iron pipes conducted the water to hydrants disposed at regular intervals over the mill terraces.[3] A stranger, at sight of the stately edifice rising in the centre of a group of offices, shops, stables, and laborers' cottages, would naturally have supposed it the mansion of some wealthy land-owner rather than a mill built in a barren district to crush silver ore, nor, on approaching nearer, would he have been undeceived by the presence of an oval basin of clear water, 50 feet long and 30 feet wide, in whose centre three water-nymphs supported a rock shell whereon floated a white swan that with upturned head spouted a jet of water high in air. The twin calves dragging a light cart over the lawn, the cackle of poultry, the grunting of swine, and the lowing of cattle would have heightened the illusion. Only the impertinent clatter of the stamps jarred upon the sense as unsuited to these surroundings, although every pains was taken to make the necessary work of milling as inoffensive as possible, and the disagreeable powder from the stamps was quickly fanned to a tightly-closed dust-room. It was found expedient to make an addition to the first mill 62½ feet in length; but the only objection urged against the new structure was its injury to the symmetry of the original design. Nearly $900,000[1] were spent in building and furnishing this establishment before the close of the year 1863, up to which time it had reduced only 4,812 tons of ore by the Veatch process, at a cost of $38 per ton nominally, but actually of at least $50 per ton, as appeared by the estimate of the new superintendent, Charles Bonner, in 1864.[2] Two hundred and twenty-five men were employed in these works, and the extravagant outlay for the wages of the laborers and the maintenance of this absurd establishment was defrayed by consent of the sanguine Gould & Curry stockholders, who acted as if their bonanza was inexhaustible; yet the mill was not yet fairly completed when its entire machinery for ore reduction was discarded by Mr. Bonner, who found, after a thorough trial, that the Veatch process did not save the metal in the ores satisfactorily, and the mill was reconstructed "almost from the foundation" at a cost of $560,893.[3]

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[1] Sacramento Union, November 15, 1862; from Virginia City Daily Union, "Gould & Curry Mill."

[2] Henry de Groot, Pioneer Mills and Mill-Men."

[3] Virginia City Territorial Enterprise, September 16, 17, 1863, "Gould & Curry Mill."

It is evident that economy was not a popular study with the managers of a prosperous mine on the Comstock lode in the early years of its development at least. This is in no way surprising. The mill haciendas were simply in keeping with the prodigal ideas of the time. Men walked the streets of Virginia City as if pacing the roof of a fathomless treasure house, and their heads were constantly in the clouds. They saw a network of silver beneath their feet and the fine strands widening into solid wedges of ore. The eyes of the soberest minded even were dazzled by the vision, and the fancy of the imaginative ran wild. No metaphor can exaggerate the prevailing delirium. It would appear that a silver mist enveloped the slopes of the Sun Peak and men moved and breathed in its unnatural atmosphere. Drunk with the vapor, all prudent considerations were laughed to scorn. Timid suggestions of the utility of thrift and the possibility of an approaching exhaustion of the ore deposits were unheeded or unheard. Every large stockholder in a productive mine counted himself a nabob and scattered his money broadcast like a prince bestowing largesses. The conception of the Brazilian spendthrift in Der Seekadet is scarcely a burlesque of the Washoe production. One fits his doors with handles of solid silver and buys a library like a ledge, by the foot; another fills his water-tank with champagne to enliven the guests at a wedding.[1] Before the end of the year 1861 eighty-six companies, with an aggregate capital stock of $61,500,000, were organized to work the mines of the Comstock and outlying districts,[2] and this number was largely increased in the years immediately following. Looking backward through an interval of twenty years men may wonder and smile at the delusion. It was different at the time. In the unknown there is an almost infinite range of possibility, and who could then oppose the confident faith of the optimists except with unsupported doubts. The mines showed no signs of exhaustion, but on the contrary, every stroke of the pick revealed new treasures. Judged by the developments of the day, the mines bade fair to realize the sanguine anticipations of their owners. The nabobs in fancy might yet be nabobs in fact.

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[1] $889,614.36.

[2] Annual Reports of the Gould & Curry Silver Mining Company, December 16, 1861; December 15, 1862; December 21, 1863; December 19, 1864.

[3] Fifth Annual Report of Gould & Curry Mining Company, 1864, pp. 15, 19.

To measure the prodigal wastefulness by strict lines of necessary expenditure drawn in accordance with the economies of business conduct in older States is scarcely charitable. Californian pioneers who had lived for years in fields where fortunes were made and lost in a single summer, and in which by a stroke of a pick the poor miner of to-day became the wealthy capitalist of to-morrow, could hardly be expected to appreciate the need of thrift, for their experience had made them inveterate gamblers, and they counted on a fresh turn of the wheel to retrieve ill-luck and not upon a reserve fund in store. To such men the natural economies of prudent business management appeared parsimonious. To insist upon rigid accuracy in accounts and to stop tightly petty leaks were thought unbecoming in owners of bonanzas. Freehanded as private citizens and in their public capacity, they scorned to place in the balance niggardly estimates of profit and loss, but delighted in displaying the resources of the new district, the wealth and liberality of the companies with which they were connected, and the personal dignity of their positions by lavish expenditures in constructing works and offices. The display was in part natural and in accord with the prodigal temper of the time, and partly exaggerated, it may be, in order to assure the minds of shareholders of the unprecedented value of their stock and to dazzle and impress possible investors, for a plausible outward show of prosperity is worth as much to a mine as to an insurance office. Marble fronts, plate-glass windows, glittering signs, and obese porters have a recognized value above their intrinsic cost, as Dickens and Daudet have cleverly instanced, and it is certain that terraces and fountains and painted mills, and costly pigs and high-mettled horses could be made to serve a similar purpose. It is probable, however, that in the particular instance of the Gould & Curry mill the expenditures were the natural expression of the liberal nature and fancy of the superintendent, and not a deliberate advertisement to enhance the value of the stock of the company.

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[1] W. N. C. Maxwell, Superintendent New Idria Mine, California, formerly Superintendent Overman Mine, Gold Hill, Nevada; Jerome B. Stillson, Correspondent New York World, Letter dated July 3, 1865.

[2] Comstock Papers, No. 19; Mining and Scientific Press, March 3, 1877.

The extravagance of the managers was unchecked, if not directly encouraged, by the stockholders in the several companies. In spite of the expenses and the waste the dividends of the productive mines were large and frequent, and the fountains of money appeared to be unfailing. The shareholders spent their monthly quotas, well pleased, and did not call for increased profits through a reduction of expenses, but through an augmented production of bullion. The president of the Gould & Curry Mining Company received daily calls from the jovial stockholders in his office in San Francisco. They rarely examined the expense accounts and cared little about the methods of extracting and milling the ore. The idea of extracting only so much as could be carefully and economically reduced in the mill of the company appeared to them preposterous, and if the dividends could be temporarily doubled they did not care how large a proportion of profits was absorbed by custom mills or how much metal was lost by over-rapid and careless reduction. "Oh, snake it out," was the ordinary exhortation to the president,[1] and the pressure at San Francisco was communicated to the superintendents at the mine. Urged by this demand, they used every endeavor to increase the production. Forty-eight thousand seven hundred and forty-three tons of ore were "snaked out" in 1863, and 64,433 tons in 1864. Six-sevenths of this amount, or 97,763 tons, were reduced in custom mills during these years at an average cost of fully $24[1] per ton, precisely twice the necessary expenses of reduction by an economical pan process. (*Vide* returns of working cost in Gould & Curry mill November, 1864, "less than $12 per ton;"[2] and official statement of cost of reducing 31,792¼ tons in 1865=$12.93 per ton.)

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[1] Alpheus Bull, President Gould & Curry Silver Mining Company, 1864-1872.

Thus at least $1,000,000 profit was lost to the stockholders by their greedy haste, without reckoning the amount which would have been saved by carefully working the ores in well-conducted mills belonging to the company. The increased yield by this method would have been fully $200,000, or a difference of $2 per ton, as was shown by the returns from the third-class ores reduced in 1865 by the corporation and custom mills.[3]

	Tons.
Third class ores reduced at the Gould & Curry mill	31,792¼
Third class ores reduced at custom mills	13,716½
Average yield of third-class ores, Gould & Curry mill, per ton	$43.67
At custom mills, per ton	$41.60

Yet the ore was so rich, yielding an average return of $80.44 per ton in 1863 and $73.48 per ton in 1864, that in spite of these drawbacks dividends amounting to $2,908,800 were declared during these two years.[4] As the mine had thus paid in so short a time considerably more than the par value of its capital stock (4,800 shares at $500) and more than fifteen times the amount actually invested by the stockholders, assessments 1, 2, 3, and 4,[5] aggregating $187,200,[6] its owners did not trouble themselves about the comparatively unimportant item of current expenditures. They scarcely noticed that the expenses of the company were $5,940,297.86,[7] or more than twice the amount of profit declared in dividends and more than two-thirds of the receipts from all sources, $8,809,271,28. But this extraordinary outlay was not wholly chargeable to the mining and milling accounts, as the expenses incurred in contesting adverse claims to the mine were very considerable. No less than fifteen law-suits were brought against the company during the years 1863–'64, and six suits were instituted in addition by the company as plaintiff.[1] During the year 1864 the cost of this litigation to the company was $135,747.13,[2] and though this sum was apparently large, yet the company in comparing their accounts with those of the other leading mines on the lode considered themselves fortunate. The record of the extraordinary litigation of which these twenty-one suits form a small part is one of the most curious and instructive chapters in the history of mining industry in America.

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[1] Annual Reports, Gould & Curry Silver Mining Company, 1863-'64-'65.

[2] Fifth Annual Report of Gould & Curry Mining Company, p. 15.

[3] Sixth Annual Report Gould & Curry Mining Company, p. 24.

[4] Annual Reports Gould & Curry Silver Mining Company, 1863, 1864.

[5] Cost of the purchase from original locators being insignificant.

[6] Unpublished Annual Reports Gould & Curry Silver Mining Company, 1860-'61.

[7] Annual Reports, Gould & Curry Silver Mining Company, 1863-'64.

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[1] District Court Records.

[2] Gould & Curry Silver Mining Company, Annual Report, 1864.

CHAPTER VIII.

INTERMINABLE LITIGATION.

The contestants in the early mining-claim suits had been unequally matched. Even if the wealthy companies holding mines on the Comstock Lode could not win their cause in the courts, they could frequently effect a compromise or purchase at small cost comparatively, as the cheapest method of settlement. Still, it was often the case that no amicable settlement could be concluded on reasonable terms, and rival holders were therefore constrained to submit their claims to the decision of a jury. The first locators on supposed parallel ledges would have been unable to carry on a war of litigation successfully, but their rights were gradually transferred in many instances to organized companies, who had sufficient funds to contest the single-ledge theory or the identity of any two neighboring ledges. Sometimes the expenses of the suits were defrayed, in part or wholly, by the ore product of the contested claims, but usually they were met by the levy of assessments. The very perfection of company organization which contributed largely to the persistent development of unproductive claims aided also to support and prolong the war in the courts. By the issue of printed certificates of stock the former cumbrous method of transferring shares in a mine by formal legal conveyances was abolished and fees were no longer paid to recorders and notaries public, who had hitherto reaped a rich harvest from the speculative mania.[1] Such certificates were readily sold or exchanged, and stock-brokers at once took the place of the mining-claim brokers who negotiated the sale of "feet" upon commission. Thirty-seven of these pioneer stock-brokers soon organized for mutual convenience as the San Francisco Stock and Exchange Board, September 1, 1862.[2] This noteworthy board was the precursor of a number of mining-stock exchanges which sprung up later in San Francisco and elsewhere; but it has always been first on the Pacific coast in importance and prestige as well as in origin. Through the medium of this and other exchanges shares in any mine owned by a stock company could be readily bought. Fighting claims, so called, were sold almost as readily as productive mines, either because the claim title was thought to be sound or for the sake of exacting black-mail, and assessments were freely paid to maintain alleged rights in the courts, for the tax was not burdensome at first, owing to the subdivision of the stocks among numerous holders.

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[1] San Francisco Daily Stock Report, September 27, 1879.

[2] San Francisco Daily Stock Report, December 22, 1879.

Upon the opening of the First District Court by Judge Gordon N. Mott, in February, 1862,[1] the multitude of suits which had been accumulating during the past twelve months were eagerly pressed for trial. Every claim of any value in the district was in litigation; the single-ledge theory was passionately combated, rights of rival locators were hotly asserted, and the confusion was worse confounded by the vagueness of the notices of location and the lack of trustworthy records. Trespasses, fraud, and perjury were the natural outcome of the insufficiency of the mining regulations and the laxity with which they were enforced.

"The United States Territorial Court," wrote a trusted correspondent of the San Francisco Bulletin (July 14, 1862), "finds all things disarranged. The court tried its hand in a leading suit between the Sacramento and Sierra Nevada companies. The jury found a verdict, and the court set it aside. We shall never outgrow this perpetual litigation in mining matters until the courts here shall rule that all indefinite, floating claims and locations are worthless in a contest with claims and locations which are well defined and made in accordance with the letter and spirit of our mining laws. * * * * Hundreds of the recorded claims are so ambiguous and indefinite that they will not bear examination in this light for a moment." Hence arises "a perpetual uncertainty in titles until it has become a by-word that, if you find anything worth having, some one will ring in with a suit to dispossess or levy black-mail."

The absurd facility with which a fighting claim could be trumped up was clearly shown in the suits brought by the Grosche Gold and Silver Mining Company against the Gould & Curry and the Ophir mining companies in the Twelfth District Court of California. Whether the Grosh brothers ever made a location on the side of Mt. Davidson is immaterial. It is certain that they developed no ledge and that all their record notices were lost.[1] To found a claim to 3,750 feet on the Comstock ledge upon their vague discoveries was simply preposterous; yet the Grosche Gold and Silver Mining Company was incorporated in 1863 with a nominal capital of $5,000,000,[2] afterward increased to $10,000,000, in order to maintain this claim, which embraced the richest portion of the ledge so far as developed, including the sections held by the Gould & Curry, Ophir and Mexican companies,[3] and well-known citizens of San Francisco consented to serve as trustees or directors.[4] The poetical editor of the Territorial Enterprise might fitly present this claim in a revised version of well-known nursery rhymes, but the Gould & Curry stockholders did not see the humor of it—

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[1] First District Court Minutes, Book I, p. 22.

The Ophir on the Comstock
Was rich as bread and honey,
The Gould & Curry further south
Was raking out the money.

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The Savage and the others
Had machinery all complete,
When in came the Grosches
And nipped all our feet.

Sacramento Union, Sept. 2, 1863.

The total expense of defending the valid titles against this attack cannot be ascertained, but the Gould & Curry Mining Company, who sustained the brunt of the litigation, paid out nearly thirteen thousand dollars ($12,993.30) on this account during the year ending November 30, 1865.[5] The actions were dismissed at the cost of the plaintiff March 9, 1865,[6] but the Gould & Curry Company had been forced to assemble witnesses from all parts of the country, and fortify their title against an assault which was a clear case of black-mail.[7]

Little prescience was required to foretell the issue of the mining suits in the district when the editor of the Territorial Enterprise confirmed the prediction of the Bulletin correspondent, May 15, 1863: "During the present and coming terms of the district court in this city twenty-five or thirty cases of the greatest importance, involving property valued to-day at probably not less than $50,000,000, will be reached. In three cases out of five the juries will fail to agree, and the remaining two will be re-heard or appealed to the supreme court of the Territory and from that tribunal to the Supreme Court of the United States, there to remain subject to the assessments of a coming generation. In the meantime the mines in dispute will be worked imperfectly and without system, and every branch of industry in the Territory must feel the effects of this interminable litigation."

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[1] Richard M. Bucke, London, Canada.

[2] Sacramento Union, August 4, 1863.

[3] Letter of Grosche Consolidated Gold and Silver Mining Company, Sacramento Union, September 2, 1863; Mining and Scientific Press, September 28, 1863.

[4] Sacramento Union, March 3, 1864.

[5] Sixth Annual Report Gould & Curry Silver Mining Company, 1865, p. 21.

[6] San Francisco Evening Bulletin, March 9, 1865.

[7] Alpheus Bull, President Gould & Curry Silver Mining Company, 1864-1872.

The cloud of uncertainty which rested on these trials grew blacker and more heavy from month to month. Witnesses were manufactured by wholesale, and testimony to suit the requirements of a case was bought and sold with scarcely a pretense of secrecy. No facts were so clear and well established that they could not be controverted by a troop of hired liars, and the trials became conflicts, in which witnesses were pitted against each other on the ground of numbers rather than of competence or character, for a hundred asseverations of ignorant, prejudiced, and corrupt men were relied upon to outweigh the careful reports of trained observers. In the excitement of the contest each claimant believed his opponent unscrupulous, and under the plea cf self-protection was tempted to resort to any method of defense. "We had to fight fire with fire," said a leading lawyer of the Californian bar, and the metaphor needs no exponent. Wealthy Californians who had invested fortunes in these mining claims saw the imminent peril of their savings with a dread which obliterated considerations of abstract morality. Some contented their consciences with taking no active part in the struggle except furnishing the sinews of war, and closed their eyes and ears to the unpleasant sights and sounds beyond the Sierras. Every well-meaning man washed his hands of the stain as far as this was in his power, and eagerly shook off the burden of responsibility upon less fastidious shoulders, for agents could always be found to carry out a plan scarce hinted at by their employers with a ready comprehension which did credit to their intelligence. If a stake which never existed was a necessary link in the chain of evidence, that stake would be created out of thin air; if a barren strip of porphyry or a body of paying ore was required, porphyry or ore would be discovered in quantities and position to suit the demand.

Generally no instruction was requisite. An important witness summoned from a neighboring State would agree to come if allowed several thousand dollars for his valuable time and incidental expenses, and once on the ground, after a brief survey of the points in dispute, he would proceed to earn his wages by swearing voluntarily and positively to what he conceived would best serve the interest of his employer—but if drilling was needed it was never lacking. There were instructors on the ground who could take a witness through a drift or cross-cut and make him see clearly a seam of ore or a mass of barren rock along the same wall under the eye-opening influences of liquor and a per diem allowance. Some witnesses would require more than others, but every man had his price, unless he valued himself too highly. If one side summoned a long array of witnesses to attest a fact, the other side met the challenge by ranging a still greater number in line against them. If twenty-eight witnesses testified in favor of the Union Company, for example, fifty-seven would and did appear for the Yellow Jacket Company, and the number of witnesses subpœnaed was largely in excess of those actually called to the stand.[1]

The same corrupt influences were brought to bear more secretly and less frequently perhaps upon the juries impaneled. In a district where everybody speculated in mining claims it was practically impossible to obtain an unprejudiced jury, but the bias was intentionally increased in many instances by direct bribing. A discreet observer wrote with simple irony to the Virginia City Territorial Enterprise in 1865 (February 16th), to inquire "Whether the following transactions would disqualify a gentleman from serving as a juror in future: 1. Throwing out of the court-house window a paper on which was written 'See me with $1,000; I will then tell you to-morrow morning how the thing will go, and we can make money.' 2. Taking the wrapper from a cigar and having replaced it with a note on which my terms were written, leaving the inclosed cigar where my friend could get it. 3. Finding a note under the lining of my hat offering me '$5,000 provided you go for us,' but giving my verdict only to be fooled by the company." The inquirer fortified his assumed position by quoting from Johnson's Life of Addison the saying: "It is not necessary to refuse benefit from a bad man when the acceptance implies no approbation of the crime." The occurrences mentioned were notorious and illustrate the cruder Washoe methods of obtaining a favorable verdict. The public confidence in jurors as well as witnesses was sorely shaken. Even the integrity of the presiding judges did not escape suspicion. Disgraceful rumors were current assailing the honor of members of the highest territorial judiciary. The atmosphere of distrust was all-pervading.[1]

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[1] October 12, 1863; District Court Minutes, Book 3, pp. 92, 105, 109; William M. Stewart.

Under these circumstances, therefore, it is not surprising that possession was accounted the surest confirmation of title and that the control of disputed claims was often determined by force. The Keystone Company drove away the miners of the Peerless Company, pitched their windlass and buckets down their shaft, and filled it up to the surface with rocks and earth.[2] The workmen of the Grass Valley Company were suddenly assailed through a drift cut as a counter mine by the Bajazette and Golden Era Company, and forced to fly to the surface (August 11, 1863).[3] The Uncle Sam Company "hustled the Centerville knights off their ground" (February 24, 1864) and filled up the hole they had dug.[4] Yellow Jacket miners cut a drift into the Gentry Company's shaft (April 9, 1864), built a fire in it and smoked out the rival party.[5] Resolved not to be ousted, the expelled miners rolled down rocks and dirt into their shaft until it was filled above the opening made by the hostile drift and began work a second time. The Yellow Jacket Company followed up their attack, opened the shaft again (April 22, 1864) and built another fire. Their rivals resolved to fight fire with fire, and threw down quantities of inflammable rubbish which soon sent up a dense black smoke. The Gentry shaft was closed at the surface and the smoke and vapors found their only vent through the Yellow Jacket drift, driving out the miners. The war was kept up for days "with all sorts of stinking smudges." An incautious Gentry miner was once nearly smothered, and the wind blew the strong odors to the neighboring houses with disgusting effect.

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[1] "Chicanery won more suits than eloquence and learning, and bribery and corruption more than solid merit. At that day (1863) the practice of the law had to some extent degenerated into the practice of villainy;" Nevada Reports (Helm), No. 4, p. 16; Address of R. M. Clarke, Attorney General, State of Nevada, May 13, 1867, upon death of Cornelius M. Brosnan, Justice of Supreme Court, State of Nevada.

[2] Territorial Enterprise, May 22, 1863.

[3] Territorial Enterprise, August 12, 1863.

[4] Territorial Enterprise, February 25, 1864.

[5] Gold Hill News, April 23, 1864.

"Regular campaigns are carried on where two companies are working close to each other in disputed ground. Though neither company can see what the other is doing they can give shrewd guesses. With ear applied to the wall of his own drift the sagacious miner contrives to study out the whereabouts of his rival and the direction in which he is moving. Perhaps the miner finds that they are advancing in a line to intercept him. He then strains every nerve to get so far ahead that if they continue their course they must come into the drift behind him. To avoid this they give up the chase and turn on their proper course. Then the pursued become pursuers in turn, and start a drift to head off their enemies. Sooner or later the works cut into each other."[1] So the Baltic Company invaded the Caledonian lines, but were straightway smoked out by their rivals, April 26, 1864,[2] and the Gould & Curry miners broke down the barricade erected by the Seneca men[3] and cut their windlass and ropes to pieces.

But these contests were of minor importance compared with the contention between the Ophir and Burning Moscow companies. The Lucky Company, on April 19, 1860, had recorded the following location:[4]

VIRGINIA CITY, U. T. *April 19, '60.*
BURNING MOSCA LEDGE LUCKY Co

We the undersigned claim (2400) twenty four hundred feet of this Quartz Ledge with all its dips angles and spurs running North (1200) feet and south (1200) feet to *corisponding* notices and stakes said claims are situated about 60 sixty rods *west* of Virginia City and lying between the *Centrail* and Virginia Ledges and *runing* north and south *paralel* with the same.

WM. BICKERSTAFF
THOS CATER and ten others.

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[1] Gold Hill News, April 27, 1864.

[2] *Ibid.*, April 27, 1864.

[3] *Ibid.*, July 6, 1864.

[4] Virginia Mining District Records, Book E, p. 101.

The west side of the ledge claimed by this company was found by survey to lie about 200 feet below the croppings and line of the Virginia Ledge, and the east side was alleged to be distinct from the lode owned by the Ophir Company.[1] The name of the association was soon changed to the dazzling sobriquet of Burning Moscow, by incorporation as a stock company, with a nominal capital of $480,000, represented by 4,800 shares of $100 each; but the original title was justified on the 26th of August, 1862, when telegrams from the mine received in San Francisco brought the shares of an obscure company, never before quoted on the stock-exchange list, to the front at once. The sales during the next three days illustrate excellently the instability of the early market. On the 26th of August[2] the first 140 shares offered were bought in at $50 per foot; then 68 shares were sold at $75 per foot; then 100 shares at $100 per foot. This steady advance and the inquiry for the stock warned the early sellers, and the purchasers of the next block of shares, 40 in number, paid for them at the rate of $230 per foot; 160 shares, the next sale, brought $250 per foot, and the climax was reached by the sale of 40 shares at $275 per foot, August 27th. On the following day the bubble broke. Everybody wanted to sell and nobody to buy. The only sale recorded during the remainder of the week ending August 30th was of 100 shares at $50 per foot, and during the subsequent week the stock fell still lower, the final sales being made at $40 per foot. At the close of the month it had rallied somewhat, but the levying of an assessment of $2 per share broke the market again for a time, and the uncertain issue of a pending suit with the Madison Company, a neighboring claimant, made buyers cautious.[3] The demand for the stock was light and fluctuations correspondingly trifling until the middle of February, 1863, when well-informed speculators began to buy in the stock quietly. Four hundred and thirty-four shares were sold during the week ending February 21, 1863, at prices ranging from $75 to $100 per foot, and 405 more during the following week at a slight advance, which was followed by a corresponding decline on receipt of the news that the jury in the suit with the Madison Company could not agree on a verdict.[1] But a few days later telegraphic advices were received that a bonanza had been struck equal to that of the Ophir Company, and 3,792 shares, more than three-fourths of the entire stock of the mine, changed hands during the five weeks ending April 4, 1863.[2]

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[1] San Francisco Evening Bulletin, January 28, 1861; Virginia City Correspondent, January 22, 1861.

[2] Sanborn's Weekly Stock Circular, August, 1862.

[3] Sanborn's Weekly Stock Circular, September, 1862.

The ledge where the ore-body was found was said to be twenty-three feet in width, with smooth and regular walls covered with clay, and distinct from the ledge of the Ophir Company in every respect except value. This was, of course, denied by that company, whose counsel had already brought suit against the Burning Moscow (March 16, 1863)[3] to recover possession of the disputed ground. To establish their case cross-cuts were at once begun by the Ophir miners, and on the 14th of May, 1863, they succeeded in cutting into the Burning Moscow works.[4] They were repulsed by the rival miners, but on application to Judge Mott, the counsel for the Ophir Company succeeded in obtaining an order restraining the Moscow Company from further work in their mine until the conclusion of the arguments in the application for a permanent injunction. The stock of the Moscow Company fell on receipt of this news one-third in value (from $155 per foot to $104), and was brought still lower by the news of a disagreement of the jury, who stood six to six in the (second) trial of their suit with the Madison Company.[5] Holders of stock were very glum and their temper was little improved by the news that the judge had consented to modify his order so far as to allow their company to prospect and timber their mine, but not to remove any ore.

The decision of the application for a permanent injunction was delayed from month to month. The shares fluctuated in value for a few weeks, but were virtually shelved or sold in small quantities at low prices[6] until the month of September, 1863, when it became known to a limited circle that Judge Mott was on the point of resigning and that his probable successor was a Nevada lawyer who was more favorably disposed to the "many ledge" theory.

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[1] Sanborn's Weekly Stock Circular, February 21, 28, 1863.

[2] *Ibid.*, March 7—April 4, 1863.

[3] District Court Records.

[4] Sanborn's Weekly Stock Circular, May 16, 1863.

[5] Sanborn's Weekly Circular, May 23, 1863.

[6] Sanborn's Weekly Circular, June—September, 1863.

Upon this encouraging report the stock came into active demand again,[1] and 4,318 shares, nearly the whole stock of the mine, was sold in five weeks at prices ranging as high as $355 per foot.[2] The Ophir Company endeavored to check this "boom" by a second assault upon the works of the Burning Moscow mine, October 23, 1863; but after several attacks and repulses the superintendent of the Burning Moscow mine, Philip Deidesheimer, entered the breach with a warrant, accompanied by two deputy sheriffs, who arrested eighteen of the attacking party, including the superintendent and foreman, on the charge of riotous conduct. The prisoners were bound over to keep the peace and then released upon bail, but the indignation of the Ophir Company was at fever heat.[3] Yet they were apparently powerless, and could only view with wrath and disgust the stock of their rival rising persistently until the advance culminated, during the first week in November, 1863, on receipt of the news that Judge Mott's successor, James A. North, had granted a temporary injunction restraining them from working within the lines claimed by the Moscow Company. One thousand two hundred and forty shares, more than one-fourth of the total number, were sold in open board at prices ranging from $290 to $362 in the course of this week, and the demand was strengthened by the refusal of the judge to modify his restraining order.[4]

It was now the turn of the Ophir Company to become despondent. Their stock fell during the week ending October 31, 1863, from $1,700 per foot to $1,430 on the announcement that their suit against the Moscow Company had been dismissed,[5] and during the following week the bears brought the stock down to $1,150 per foot amid extraordinary excitement.[6] The panic appeared most ominous, but the determined upholders of the stock rallied. Opportune telegrams were received on the 6th of November announcing a discovery of rich ores in the northern portion of the mine, and the stock was carried up to $1,650 per foot. On the very day of the dismissal of their suit with the Moscow Company they began a new suit in another district of the Territory at Esmeralda (October 27, 1863), and maintained their losing cause with indomitable pertinacity.[1]

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[1] Sanborn's Weekly Stock Circular, September 5, 1863.

[2] *Ibid.*, October 3, 10, 17, 24, 31, 1863.

[3] Territorial Enterprise, October 24, 1863; Philip Deidesheimer.

[4] Sanborn's Weekly Stock Circular, November 7, 1863.

[5] *Ibid.*, October 31, 1863.

[6] *Ibid.*, November 7, 1863.

The two great rivals were prepared to meet each other on equal terms, having freed themselves, in great measure, from the attacks of petty assailants by compromises on the basis of purchase or consolidation. The Ophir Company had obtained the Middle Lead by purchasing the title of McCall and others,[2] and part of the Virginia Ledge as well by a characteristic bargain with Finney, the Washoe Rip Van Winkle.

Finney's location was the first on the slope of Mount Davidson beyond question, and in default of any binding code of mining regulations his title was unimpeached. After the discovery of the Comstock Lode he found no difficulty in disposing of his ledge in small assignments to different purchasers, and on September 3, 1860, he and his partner, John H. Berry, transferred to the Ophir Company for $7,500 two hundred and five feet, "their entire remaining interest in the ledge."[3] From the deed given by William R. Garrison, December 8, 1862, it would appear that Finney and his partner failed to recollect that they had already sold or given away 504 feet 3 inches of their original 600 feet, and that they were selling to the Ophir Company in 1860 one hundred and nine feet 3 inches more than they possessed at that time.[4] Still, in a community where mining claims were transferred like plugs of tobacco, such forgetfulness is not surprising and does not prove intentional dishonesty. In order to avoid a possible cloud upon their title, the Ophir Company demanded before closing this purchase that the original notice of location should be transferred to them.[5] Finney said that he had preserved it, but was too drunk or too cunning to explain intelligently where it was to be found. The Ophir Company determined to bring him to his senses by a stratagem, and he was accordingly induced to enter a tunnel belonging to the company, on some plausible pretext, and an iron gate at its mouth was closed behind him. On the following morning the captive was sufficiently sober to understand what was wanted of him, and though grumbling at the ill usage which he had received he consented to guide the superintendent of the Ophir mine, John H. Atchison, and Isaac E. James to the spot where he had concealed his notice on the 22d of February, 1858. He found the cache without difficulty, lifted off the fragments of rock, and drew out a strip of yellow paper covered with dust and moths' eggs, but the most precious note on the Comstock, for upon it was scrawled in still legible characters a claim to the main ledge on the slope of the Sun Peak with all its dips, spurs, and angles.[1]

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[1] First District Court Records, Nevada Territory, Book C, p. 259.

[2] William M. Stewart; Suit of Ophir Company *vs.* McCall *et al.*, dismissed at cost of plaintiff, May 23, 1863; District Court Minutes, Book I, p. 262.

[3] Storey County Records, Book D, p. 696.

[4] Storey County Records, Book F, pp. 547, 548.

[5] William M. Stewart; Isaac E. James.

The Ophir Company were willing to buy the section held by Finney in September, 1860, but they did not appreciate its full value, as they made no effort apparently to secure the remainder of the ledge. It is true that the claim was producing no ore worth extracting, but it was noticed by several shrewd observers that the ledge dipped east from its very croppings and was undoubtedly the main lead of the slope, as far as it extended. As soon as this fact was clearly shown by actual exploration, Mr. William H. Garrison bought up quietly the control of the ledge by purchasing the stock of the Old Virginia Ledge Company, and notified the Ophir Company in October, 1862, that he intended to contest their title to the Comstock Lode. A panic in the stock market at once ensued, and Ophir stock fell from $3,000 per foot to $1,800, a decline of more than one-third in value in one week.[2] The counsel of the Ophir Company saw the weakness of their position and advised a compromise.[3] Mr. Garrison at first demanded a very large sum, but was ultimately persuaded to accept $100,000 offered by the Ophir stockholders (November 26, 1862[4]), in return for which he conveyed to the Ophir Company 504 feet 3 inches of the Virginia claim and ledge, as well as 560 feet mining ground claim and quartz lode, known as the Virginia Lead of the Virginia Company, a claim located by Jacob Whitbeck and others, February 13, 1862.[5] Exactly in what place this last-mentioned company found room to stick their stakes and insert their "Lead" does not appear, but their notice was recorded in due form, and it was probably cheaper to buy them off than to fight them in the courts.

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[1] Isaac E. James.

[2] Sanborn's Weekly Circular, October 18, 1862.

[3] William M. Stewart.

[4] Sanborn's Weekly Circular, November 29, 1862.

[5] Storey County Records, Book F, pp. 547, 548.

Thus the Middle Lead, the Old Virginia Ledge, the Virginia Lead, and the Ophir or Comstock Lode throughout a section of 1,400 feet were possessed by the same company, and yet within a tract less than five hundred feet in width, by surface measurement, it was asserted that four other ledges existed.[1] It has already been narrated how, while the Burning Moscow, Middle Lead, and Old Virginia Ledge companies were harrying the Ophir Company, the Madison Company was struggling with the Burning Moscow for a share of the spoils. The appeal to litigation to decide their respective claims had twice resulted in a disagreement of the jury, and the dead-lock appeared hopeless. Moreover, the Harrison and La Crosse companies were spurring the Moscow as well, which might have disposed of them singly, but had need of all its resources for the encounter with its most formidable rival. Accordingly, on the 18th of November, 1863, the minor wars were ended by compromise and the consolidation of the four companies under the Burning Moscow charter. The capital stock of the Burning Moscow Company was increased from $480,000 to $3,000,000[2], and its hands were freed for the impending battle.

To anticipate the trial of a suit for ejectment brought in the district court December 1, 1863, arguments and testimony in support and rebuttal of a plea for a permanent injunction were submitted to Judge North. The decision of the judge, in denying the injunction prayed for by the Ophir Company, shows a curious conflict of testimony and presents clearly the defects of the existing laws in regard to ledge location and ownership. "The defendant," he said, "claims the ownership of these ledges lying between the Virginia and the Middle Lead, to wit: The Moscow, the Harrison, and the La Crosse, and claims to be mining on its own ground and not on the ground of plaintiff. The question at issue is whether this ledge is the Middle Lead or not. A large number of respectable affiants state that the ledge seen (in possession of the Burning Moscow Company) is the old Middle Tunnel Lead and is closely traced through the incline (marked 15 in James'[1] map) to the chamber in which defendant is at work. A still greater number state upon their oath that the said incline leaves said ledge entirely and runs some 55 feet through porphyry to the said chamber, and there are two ledges at this point, separated by at least 50 feet of porphyry. * * * It is difficult to see how these two bodies of quartz, separated at one point by 50 or 55 feet of porphyry, as appears both from weight of evidence and from my personal examination, and at another point by 90 feet of the same material, can be one and the same ledge. In view of the facts, at least, I cannot hold that they are proven to be one, and without this fact being proven the plaintiff falls far short of proving title to the ground on which defendant's works are situated. At the depth where this controversy arises the evidence on both sides shows that there are several and distinct ledges. If at a greater depth there shall be found conclusive evidence that all these are blended in one, when that depth is reached and that evidence is adduced, then will be the proper time to determine what ledges run out and what continue.

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[1] Ledge of La Crosse Company, located December 9, 1859, Book I, V. M. R., p. 96; Ledge of Harrison Company—Geller Ledge, located June 17, 1860, V. M. R., Book E, p. 377; Ledge of Madison G. & S. M. Co., located July 3, 1862, V. M. R., Book K, p. 521; Ledge of Burning Moscow Company, V. M. R., Book E, p. 101.

[2] Sanborn's Weekly Stock Circular, November 21, 1863.

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"The application for injunction is denied."[2] December 28, 1863.

This decision was a staggering blow against the maintenance of the single ledge theory in the courts. William M. Stewart was aware of the difficulties of the contest and the extraordinary expenses which must be incurred.[3] He was employed as counsel by the principal companies on the line of the Comstock Ledge as distinguished at that time (1862–1864) from the parallel ledges on either side, and fully realized the bitterness and uncertain issue of the pending litigation. His fees as attorney were very large, but he was willing to resign his position as counsel if a brilliant speculative combination could be effected.

His plan was a daring but sagacious one, as subsequent developments proved. He was convinced that the true dip of the main ledge of the district was toward the east and knew that its angle of inclination would soon carry it far outside of the surface lines claimed by the Ophir, Gould & Curry, Chollar, and other mines on the lode. He proposed, therefore, to the trustees of the Chollar Company, a body of wealthy and enterprising men, to quietly sell out their interests in the Chollar and other claims on the Comstock Ledge, while he, in turn, would withdraw from his position as attorney for these companies. Meanwhile the combination would buy up the supposed wild-cat claims lying outside and east of the claims on the main lode. The Chollar directors already held the controlling interest in the ledge claimed by the Grass Valley Company, and other claims in like position could have been cheaply purchased. These purchases once effected, it was his plan to induce the different companies on the lode to put an end to otherwise certain litigation by defining their surface lines or the boundaries of their claims accurately and finally. He would not conceal his own opinion that the ground to the east was valuable, but few persons agreed with him, and he was confident that the Comstock Ledge companies would readily agree to mark their eastern boundary line, if they were allowed to include the broad tract lying between the Comstock and Grass Valley ledge croppings, which he was willing to concede to them. When the boundary lines were determined it was to be stipulated that planes should be drawn perpendicular to these lines, extending indefinitely downward and that the mining operations of all companies should be confined within the limits of the planes bounding their respective claims. All pending suits should be adjusted as rapidly as possible, and the main cause of litigation having been removed, he foresaw that the mining industry of the district would expand with natural vigor.[1] Now this was substantially a relinquishment of the cherished but litigious principle which allowed a locator to follow the dips of his ledge indefinitely. and a substitution of the often-decried Spanish or Mexican system of allotment; yet it was clearly the most expedient course to pursue.

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[1] Isaac E. James.

[2] San Francisco Evening Bulletin, December 29, 1863; Sanborn's Weekly Circular, January 2, 1863.

[3] William M. Stewart.

Unfortunately, the trustees of the Chollar Company could not be persuaded to adopt Mr. Stewart's views, and he was reluctantly obliged to abandon his project and continue the fight. If he was not successful as a peace-maker he had no reason to complain of his fortune as a contestant. The leading lawyers of the Pacific sea-board were employed in the various suits and the Californian courts were, for the time, deserted, so to speak, for the more profitable field of practice in the new Territory. The fees paid by the wealthier companies to their attorneys would have dazzled Hortensius and Scævola, and were far in excess of those earned by the most competent counsel in the Atlantic States. Benjamin R. Curtis, who resigned his seat on the United States Supreme Court Bench to become the acknowledged leader of the Massachusetts bar, received an average return of $40,000 annually for his legal services during the seventeen years 1857–1874,[1] while the professional income of Mr. Stewart during the years of fiercest litigation at Washoe was $200,000 annually. The Belcher Mining Company repaid his services with 100 feet of their claim, which he sold for $100,000, and the Yellow Jacket Company gave him $30,000 as a single fee. The rewards were princely, but the labor was more exacting than the task of a slave. The vigor and earnestness with which he carried on the legal war are undisputed. Once enlisted as counsel in a case, he made the cause of his clients his own. He saw no foundation of justice in any claim of an opponent and left no stone unturned to achieve success. His known determination to win at any cost, and the belief that he would match his adversary with any weapons which the latter might employ exposed his course to sharp, if not merited, criticism; but he defied his critics to prove their assertions in the courts.[2] It must be admitted that in offering this challenge he ran little risk, for the direct complication of so shrewd a lawyer in unwarrantable practices could scarcely be proven. It is equally certain that the Washoe bar, at that time, was not a nursery for tender consciences, and if he fought fire with fire he had not a few imitators and assistants.

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[1] William M. Stewart.

All might have been content to equal him in industry and devotion to the cause of his clients. In preparation for his cases he worked day and night, seemingly incapable of fatigue. His mastery of the details of a case was so complete and his memory so accurate that during the progress of a suit he took no notes, but was able to refer in citation to testimony of the most complex and contradictory character with extraordinary correctness. During the course of one trial, if several suits in which he was engaged were to be brought up in succession, it was his practice to prepare for them in turn so fully, with the assistance of his associate counsel, that he rarely had occasion to request a postponement, but was ready to proceed to trial at a moment's notice.

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[1] Memoir of Benjamin Robbins Curtis, vol. I, p. 268.

[2] William M. Stewart, March 15, 1880.

In addressing a jury he endeavored to make his statement of the case as clear, straightforward, and simple as possible, avoiding carefully any semblance of legal quibble or trick. He placed himself on their level of comprehension, spoke to them as man to man, appealed to their crude sense of justice and fairness, and strove to convey the idea that his clients were entitled to a verdict in equity even more than by law. His opponents protested that "he was endowed by nature with a faculty of imposing the sublimest absurdities upon juries as pure and spotless truth,"[1] but the success of his method was grumblingly admired. Though abstaining from legal finesse, he did not hesitate to resort to any device of rhetoric which could serve his end. The broadest sarcasm and ridicule were effective with a jury in a mining camp whom subtle wit, however brilliant, would have failed to impress.

So in the notable case of the Yellow Jacket Mining Company *vs.* the Union Mining Company,[2] the determining cause of the verdict, as Mr. Stewart believes, was not the plea which he was able to make upon the merits of the case, but the discomfiture of a rival attorney, Mr. Frank Hereford, by a ridiculous comparison.[3] Mr. Hereford, who represented the Union Company, had only recently arrived in the Territory, and it occurred to Stewart to annoy him, if possible, and make the jury laugh, by alluding to his natural inexperience in conducting jury trials in Nevada. He compared Hereford accordingly, with absurd gravity and minuteness of detail, to a young broncho horse, untrained and fresh from the plains, brought up into the cold, thin air of the mountain city, and his arguments were likened to the first efforts of the pony who pants and gasps in the new atmosphere. When the new-comer became acclimated and had recovered his wind, so to speak, he might be of some service, but till then Stewart hinted provokingly that he was unfit for rivalry with a trained old war-horse like himself. The badinage was not charged with a delicate wit, but it was effective in accomplishing the twofold aim of provoking his rival and setting the rough jurymen in a roar of laughter.[1] Hereford's attempted retorts were skillfully parried and his able presentation of the cause of his clients obtained little consideration.[2]

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[1] Territorial Enterprise, April 5, 1863.

[2] District Court Minutes, Book 3, pp. 92. 105, 109.

[3] William M. Stewart.

In the trial of another suit of the first importance a different temper was manifested. The indignation of the jury and spectators was artfully excited by the bitter denunciation of the treachery of a leading witness until their passion was uncontrollable. In no other trial on the Comstock was such a flame of excitement kindled as in this, the suit of the Sierra Nevada Mining Company *vs.* the American Mining Company.[3]

The tract claimed under the location made by the Sierra Nevada Company had been seized upon by opposing claimants until the ground was honey-combed with prospect holes. Mr. Stewart was attorney for the Sierra Nevada Company in 1862–'63, as well as one of its trustees, and advised that suits should be brought against all locators on the disputed ground in order to quiet title, knowing that many of the cases would never be contested or brought to trial, and that judgment by default would accordingly be obtained. His advice was taken, and a complaint was made by George D. Whitney, president of the Sierra Nevada Company, setting forth the facts in the case at length and attesting them by his affidavit upon oath, as well as by the affidavits of others. The result was as the attorney had anticipated. Judgment was confessed by some of the claimants, but others, among whom was the American Mining Company, contested the Sierra Nevada title and forced the company to institute suits for ejectment.[4]

As the time set for the trial of the suit against the American Company approached (February 26, 1863) Mr. Stewart found to his surprise that no steps were taken by the president of the Sierra Nevada Company to provide for the necessary initial expenses. Mr. Whitney had so far shown himself energetic and honorable in the conduct of the suits to quiet title, and his present course appeared inexplicable. Stewart wrote to the San Francisco office of the company but received no satisfactory answer. Finally, only three days were left before the day of trial, and the attorney, suspecting treachery, determined to act on his own responsibility and promptly. He wrote to the trustees informing them of the singular course of the president and urging that one, at least, should set out for Virginia City immediately to confirm his action; but knowing that no one could arrive in time to be of any service in the preparation for the trial, he set to work without further delay. His first act was to obtain the "sinews of war," as he said, from a reluctant money-lender. With $20,000 thus procured he employed surveyors to make an accurate map of the Sierra Nevada claim and sent messengers on swift horses to Carson, Genoa, and all the valley towns for miles around to collect witnesses. Before the three days had expired he had prepared thoroughly the case for his clients, mustered a formidable array of witnesses, and was able to establish a plausible case on affirmative evidence without giving a clue to the course which he proposed to take in rebuttal. Mr. Charles H. S. Williams, who was accounted the ablest lawyer on the coast in the trial of *nisi prius* suits, had been engaged to conduct the case for the American Company. This was the first time that he had been pitted against Mr. Stewart, and the latter was disposed to make the contest a sharp one, as Mr. Williams had alluded somewhat bitterly to him in the course of a previous trial, the Burning Moscow *vs.* the Madison Company.

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[1] Isaac E. James.

[2] Territorial Enterprise, October 24, 1863.

[3] First District Court Records, Book I. pp. 331, 336, 338.

[4] William M. Stewart

On the night before the trial, February 25, 1863, Mr. Whitney arrived on the stage from California, and he had hardly entered the city before Stewart telegraphed to the other trustees that they were betrayed and that the trial could not be postponed. He did not know Whitney's intention, but suspected the truth, as was afterward ascertained, that the inducement held out to him was a large amount of stock in the American Company, which Whitney took after disposing of the greater part of his interest in the Sierra Nevada.

The trial began on the next day in a crowded court-room. Mr.

Stewart made out a *prima facie* case, as he anticipated, and contented himself at first with a concise statement of the facts, hinting at the singular action of Whitney, but purposely moderate in tone. Mr. Williams incautiously replied, committing himself more fully than he would have spoken upon second thought in defense of Whitney, whom he proposed to call as a witness. This was Stewart's object, and when it fell to his turn to cross-examine Whitney, March 3, 1863, he contrived to obtain much more minute and positive affirmations than had been elicited in the direct examination. Then he turned sharply on the witness and produced the complaint to which the latter had sworn six months before. He went over this, sentence by sentence, showing a direct conflict of testimony on the important points. "Did you swear so and so," he would ask, "six months ago?" Whitney moved uneasily on the stand, hesitated, stammered, made evasive answers, and soon became utterly confused. Stewart pressed him more hotly than ever and drove him fairly to the wall. The crowd in the court-room catching the purport of these ringing questions and seeing the apparent faithlessness, became passionately excited, half through personal interest and half through a contagious sympathy. The trembling witness appealed to the judge, Hon. Gordon N. Mott, but the judge decided that the questions were pertinent and must be answered. Surrounded by a densely packed ring of threatening faces and assailed implacably by his inquisitor, Whitney suffered a keen torture for several hours on the stand. At last he was permitted to retire, but the effect which the shrewd lawyer had aimed to produce was attained.

In summing up the case for the Sierra Nevada Company he had the opportunity for which he had been waiting, for the crowd in the court-room were already strongly moved by the developments in the case, and were prepared for the passionate invective and appeal which he knew how to make. He painted the act of Whitney in the darkest colors as the trick of a renegade, false to his duty, false to his friends, false to his honor. The witness had sworn to a tissue of lies which had been laid bare in all their blackness, and left the stand branded for life as a perjurer who had betrayed his trust. Scarcely less bitter was the attack upon the defending counsel. He styled the introduction of Whitney as a witness an unpardonable crime which was a burning disgrace to the conductors of the defense. It involved Williams as a guilty associate in a shameful conspiracy and would remain an enduring stain upon the profession to which he belonged.[1] The jury caught the passionate glow and heat of the speaker and bent forward eagerly to listen. The spectators muttered sympathy and crowded closely about the bar. When Stewart spoke his last fierce sentence an ominous murmur ran through the court-room. The attempted defense of Mr. Williams was ineffective. The jury were deaf with passion, and left their seats inflexibly prejudiced against the witness Whitney and the case of the American Company. They did not waste time in reconciling possible differences. One man alone was inclined to protest against the action of the majority. They told him that they would hang him if he persisted, and having a well-grounded faith in this assurance he yielded instantly, and a verdict was rendered at once for the plaintiff, the Sierra Nevada Company, March 5, 1863.[2]

Contests like these could not long be maintained without exhausting even the plethoric purses of Californian millionaires. The legitimate costs of this multitude of suits were enormous, and the expenses of fighting fire with fire were insupportable. The legal war culminated with the remarkable case of the Chollar Mining Company *vs.* the Potosi Mining Company, the immediate cause of the resignation of the whole Territorial bench and a contention without a parallel in the history of the litigation of mining claims in its duration, fierceness, and cost.

Even in May, 1862, it was spoken of as the "Jarndyce *vs.* Jarndyce" case, and yet the contest was in its infancy.[3] In December, 1861, notice was given by the Chollar Company to the Potosi Company that they intended to bring an action to recover possession of "a surface claim about 1,400 feet in length and 400 feet in width (the same premises surveyed by James P. Stratton), including the Comstock lead or ledge, so-called, with all the dips, angles, spurs, and variations thereof, together with all the quartz, leads, and ledges and earths containing the precious metals within said described boundaries."[4] An action of ejectment was accordingly brought January 17, 1862, and the claim of the Chollar Company was supported by the introduction of four titles, known as the Webb, Kirby, Chandler, and Beach locations.[1] The Potosi Company denied the infringement of any rights acquired under these titles, as they were not working in surface ground, but in a well-defined ledge located by them in accordance with the district laws.

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[1] William M. Stewart.

[2] District Court Minutes, Book I, p. 338.

[3] San Francisco Evening Bulletin, June 3, 1862; Virginia City Correspondent, May 30, 1862.

[4] District Court Records, Judgment Series No. 96, Law, Book D.

The question here at issue was of manifest importance. Early locators who staked out surface claims had no knowledge that anything of value existed within their boundary planes except the shallow stratum of sand and gravel lying upon the bed rock. This they could wash in their rockers or reduce in the simple arrastras. They had no means of crushing the bed rock and no idea that it was worth developing. But when the existence of silver ledges in the mountain side was announced every surface-claim holder maintained his right to all ledges whose apices were within the boundary lines of his location. They did not care what the fair construction of their original claims allowed them, and wasted no time in discussing the difference between surface and ledge locations. They were convinced that the bed rock or ledges belonged to them as well as the surface soil, for they would certainly have claimed the rock in the first place if they had known of its richness. An intention, however vague in scope, was equivalent to an action in their minds, and they determined that others should view the matter as they did. Possession was more than nine points of the law in a mining camp, and the surface locators generally succeeded in holding their ground.

The equivocal wording of their claim-notices was of marked service to them when their rights were questioned. Many of them claimed "quartz and surface" within a given area, and held that they meant ledges by the word quartz and not merely the broken and decomposed rocks of the surface ground. Some used the term wittingly in this sense, no doubt; to others again it was a mere catchword, repeated parrot-like from the text of notices which they had seen. Few knew enough of quartz mining to detect or develop a ledge, and fewer still intended to search for one. Above all, the assertion of a right to follow the dip of a ledge beyond the boundary planes of a claim was assuredly an after-thought, first maintained when ore bodies had been discovered in adjacent claims by more enterprising miners. Often such discoveries were the first suggestion to the holders of surface claims that ledges existed within their boundaries; yet they coolly undertook to rob their informants of all the proceeds of their labor. Such an attempt contravened common law and common sense. In 1858 it would have been laughed at as preposterous; but three years later it was strenuously made by means of lawsuits and shotguns, for then the right of the original locators or their assigns to follow the dip of ledges was expressly recognized by the district laws. The points at issue were, therefore, (1) whether a location for "quartz and surface" was a "ledge location" within the meaning of the law, and (2) whether a ledge location made subsequent to such surface and quartz location, upon the discovery of a ledge *outside* the limits of the location aforesaid, entitles the locator and discoverer to follow the ledge with all its dips and spurs wherever it may go, even if it should run into the lines of the surface location.[1] The action for ejectment brought by the Chollar Company against the Potosi Company would obviously tend to determine the latter point by settling whether the Potosi Company had a right to trace their ledge within the lines of the Chollar Company and remove ore from within those lines.

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[1] District Court Minutes, Book A, p. 117; Virginia City Territorial Enterprise, May 6, 1864.

The trial of this action in the district court lasted for more than a week, exciting general interest. The presidents of all the leading companies on the lode were present, and the array of counsel on either side was unprecedented in Washoe trials. The jury announced, May 29, 1862, that they stood five for defendant and seven for plaintiff, and could not possibly come to an agreement.[2] They were accordingly discharged and a new trial ordered,[3] which took place in October of the same year, and the suit, then accounted the "*pons asinorum*"[4] of the protracted term of court, was finally decided in favor of the Chollar Company October 20,

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[1] *Vide* Request of Counsel for Potosi Company made to Judge Mott to obtain certain instructions to jury; Mining and Scientific Press, January 5, 1863.

[2] District Court Minutes, Book I, pp. 154-163.

[3] District Court Minutes, Book I, p. 185.

[4] San Francisco Evening Bulletin, October 23, 1862.

1862.[1] Thus the Potosi Company were constrained to abandon work on their ledge within the boundary planes of the claims owned by the Chollar Company, and their rival possessed the fruit of their labors.

During the week ending October 11, 1862, Chollar and Potosi mining stocks were accounted of nearly equal value in the San Francisco market, 85 shares of Potosi stock selling at from $145 to $165, while 20 shares of Chollar stock were sold at $140.[2] Chollar stock rose steadily in value during the trial of the suit for some reason, 587 shares being sold during the week ending October 18 at from $150 to $220.[3] No sales of Potosi shares were reported during this week, sellers and buyers being alike timorous; but on the announcement of the result of the trial Potosi stock was thrown on the market at any sacrifice, the price per foot dropping more than $100. One hundred and seventy-three shares were sold during the week ending October 25, 1862, at from $50 to $60, and stock could be bought on the last day at a further decline of $20 per foot. Chollar stock bounded upward with corresponding rapidity, 250 shares selling at from $290 to $320 during the same week.[4] A motion for a new trial was overruled (November 11, 1862)[5] and an appeal taken, as a matter of course, to the Supreme Court of the Territory, where the decision of Judge Mott was sustained by a judgment rendered in March, 1863.[6]

Potosi stock, which had rallied somewhat, suffered another sharp decline, but the managers of the company were by no means disposed to give up the contest. A shaft was sunk, accordingly, outside the eastern boundary surface line of the Chollar Company and a deposit of rich ore was soon reached. The contention was instantly renewed, and cross-suits were instituted by both companies. The managers of the Potosi Company believed that Judge Gordon N. Mott was biased in favor of the claims of the Chollar Company, and as the chief justice, George Turner, was accounted also a Chollar partisan, they resolved to change the constitution of the bench by inducing Judge Mott to resign and obtaining the appointment of James W. North, a lawyer who was known to hold a different opinion as to the rightfulness of their claims. How this plan was carried out was bluntly stated by the Virginia City Territorial Enterprise, July 26, 1864, fully indorsed by the Gold Hill News of the same date, and substantially confirmed by a decision of referees in a libel suit instituted December 6, 1864:[1] "We assert that Judge North's place on the bench was bought for him. The price paid was $25,000. The payee was Gordon N. Mott. The person paying it was John H. Atchison, in behalf of the Potosi Company. We believe that there was some flimsy pretext of railroad business which glossed over the payment of the money to Mott, but it will not be pretended that the object of paying Mott was any other than to get North on the Bench."

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[1] First Judicial District Court Minutes, Book I, pp. 251, 253, 278, Judgment Series, No. 96.

[2] Sanborn's Weekly Stock Circular, No. 31, October 11, 1862.

[3] Sanborn's Weekly Stock Circular, No. 32, October 18, 1862.

[4] Sanborn's Weekly Stock Circular, No. 33, October 25, 1862.

[5] District Court Minutes, Book I, p. 278.

[6] Sanborn's Weekly StockCircular, March 21, 1863.

There is no evidence that Mr. North knew of the payment of this money, but he must have known whose influence secured his place on the bench, although an endeavor was made to keep the transaction secret lest the Chollar Company should take alarm and oppose the candidate of their rival. On September 14, 1863,[2] Mr. North received a telegram from Washington officially notifying him of his appointment as associate justice, and advising him that his commission had been forwarded. He opened court the same day, pursuant to the adjournment made by Judge Mott.

The Chollar Company had lost a valuable ally and became at once aggrieved and suspicious. A drift from their ground cut into the deposit found by the Potosi Company, and injunctions were applied for by both companies. On the hearing of the application by the Potosi Company for a preliminary injunction before Judge North, affidavits were offered by the Chollar Company, defendants, for the purpose of proving their rights under the Webb, Kirby, Beach, and Chandler locations, the custom of miners in the location of claims, the position and development of their ledge, and also to show what was litigated in the suit decided in October, 1862. The Potosi Company, plaintiff, objected on the plea that the ground in controversy was litigated in the former action, and that the record in that action was a bar to any subsequent action or proceeding based on the old titles.[1]

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[1] Washoe Times, October 21, 1865; Territorial Enterprise, October 25, 1865; "Referees' Decision in Full."

[2] Virginia City Territorial Enterprise, September 15, 1863.

In other words, the Potosi Company claimed that a boundary plane separating their ledge from the ground belonging to their rival was established by the decision in the former suit. They did not dispute longer the right of the Chollar Company to the ledge or ledges west of this boundary plane, but they maintained their own clear title to the ore-deposit or ledge discovered by them east of this plane. They averred that this ore-deposit was in a ledge distinct from any whose apices were within the Chollar boundary lines, but they contended that even if the ore-deposit was in a continuation of a ledge owned by the Chollar Company yet this company had no title to it based on the Webb, Kirby, Beach, and Chandler locations. These locations had indeed conveyed all the ledges within the boundary planes of the Stratton survey, but no right to follow the dip of such ledges outside of these planes. This position, as they alleged, was established by the verdict in the former trial, as no rights could be maintained other than those expressly conveyed. In short, under surface and quartz locations only the ground allowed by the common law could be legally claimed, and the provision of the district mining law allowing locators to follow the dip of their ledges was inoperative.

After considering the briefs submitted, Judge North granted the preliminary injunction prayed for by the Potosi Company (February 19, 1864), and the Chollar Company were directed to cease work on the ledge within the lines claimed by the Potosi Company until the 11th of the following month, on which day they were called upon to appear through their counsel to show cause why they should not be permanently enjoined from working within these boundaries. The Chollar Company gave bonds as a warranty of obedience to the order of the court, and withdrew their miners sullenly from the disputed ground.[1] The trustees of this company had bought up the controlling interest in the claim of the Grass Valley Company, by Mr. Stewart's advice, but in spite of one hundred and seventy affidavits submitted to Judge North, he had denied (December 14, 1863) the injunction asked for against the Potosi Mining Company on the ground of the Grass Valley location title,[1] and on March 16, 1864, he refused permission to unite the suits of the Chollar and Grass Valley Companies against the Potosi Company.[2] The only result of this purchase was, therefore, to place the Potosi Company in the centre of the ground claimed by their adversary, which they were proceeding to develop with irritating effect.

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[1] Virginia City Territorial Enterprise, April 3, February 20, 1864.)

On the 31st of March, 1864, Judge North rendered a final decision in the suit of the Potosi *vs.* Chollar Company, to the effect that no affidavits should be admitted "to show locations which have once been litigated between the parties to this action, or to show the customs affecting such locations, or to show what was litigated in the former suit, or to determine whether the former suit is a bar."[3] The editor of the Stock Circular wrote on April 2, 1864, that this decision in favor of the Potosi Company had placed their title beyond question, but he did not realize that Washoe attorneys, like John Paul Jones, did not know when they were beaten.[4]

The vital importance of obtaining the reversal of this decision was day by day more painfully realized by the Chollar Company, and their rival, the Potosi Company, was equally alive to the necessity of its confirmation by the court of appeal. It was universally understood that Judge Turner was in favor of the Chollar claim and Judge North equally determined to combat it. The whole strife was therefore to gain over the third judge, P. B. Locke, and the fight which ensued affords an unique picture of a judicial bench.[5]

The appeal from Judge North's decision was argued and submitted in the Supreme Court April 28, 1864. On the evening of the day when the argument was closed Judge North with Judge Locke and two others rode from Carson City to Lake Tahoe, 14 miles distant, although Judge North had left the bench a few hours before, declaring himself too ill to sit. This singular excursion for a sick man so startled the representatives of the Chollar Company that William Stewart, Alexander Baldwin, and two friends at once procured a carriage and started in pursuit, "stating that they wanted to see who the brokers of the Potosi were, and, if possible, stop negotiations."[1] Soon after the arrival of the pursuers and pursued at the Glenbrook House, on the lake, a prominent holder of Potosi stock rode up to the hotel with a companion — "accidentally, of course" — on their way to San Francisco, but appeared somewhat astonished, it is said, to find the company so "badly mixed," and made only a short stay.[2] After their departure the Chollar representatives took possession of Judge Locke, ordered an extravagant supper at midnight, and kept up a Washoe symposium till morning.

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[1] Weekly Stock Circular, December 19, 1863.

[2] Weekly Stock Circular, March 26, 1864, April 2, 1864; First Judicial District Court Minutes, Book III, p. 191.

[3] First Judicial District Court Minutes, Book III, p. 206.

[4] Weekly Stock Circular, April 2, 1864.

[5] Gold Hill News, August 3, 1864, Editorial; The Chollar Gold and Silver Mining Company, plaintiffs and appellants, *vs.* the Potosi Gold and Silver Mining Company, defendants and respondents; and the Potosi Gold and Silver Mining Company, plaintiffs and respondents, *vs.* the Chollar Gold and Silver Mining Company, defendants and appellants; Records and Judgments Supreme Court, Nevada Territory, Book A, p. 90.

By an uncommon effort of will Locke took his seat on the bench that same day, while the Chollar advocates rejoiced in the persuasion that he was convinced by their effective reasoning. The court adjourned, and on the next day Judge Locke went to Virginia City with a Chollar attorney, Alexander Baldwin. On his arrival he told Mr. Baldwin that he should lodge at the International Hotel, but changed his mind, apparently, for he took up his quarters in rooms belonging to Judge North. On Sunday, May 1st, he dined with Potosi sympathizers at the office of the Gould & Curry Company, and the confidence of the Chollar party was changed to alarm. Judge North returned to Virginia City on the next morning, and, after an interview with Judge Locke, opened the session of the district court. The rumor spread during the day, apparently from an authoritative source, that Judge Locke had been gained over by the "arguments" of the Potosi Company and would decide in their favor; but the Chollar advocates determined not to give up the fight, and went to Judge Locke's chamber, where another convivial party was made up, which finally adjourned for a ride to Carson City. Judge Locke, with the confidence inspired by liquor, insisted on driving, and, naturally, upset the carriage over a high bank, breaking it to pieces, while the sober horses ran away. Two other carriages were obtained at Silver City and the party started again, Locke dividing his time impartially, it is said, in "drinking, quarreling with the teamsters on the road, and hugging his companions."[1] On the morning after his arrival at Carson he took his seat on the bench and deliberated with his associates upon the important cases laid before them. Between the hours of 12 m. and 3.30 p. m. sixteen cases were decided, every one of which was affirmed. No opinion in the Chollar-Potosi case was filed at the time, but there was an impromptu celebration that night at Dorsey's Mill, three miles from Carson, by well wishers to the Potosi cause.[2] Immediately afterward George D. Roberts, an agent of the Grass Valley Company, denounced Judge Locke as a perjured scoundrel, having previously notified him of his intention so to do.[3]

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[1] William M. Stewart.

[2] Gold Hill News, August 3, 1864.

On the following day, May 5th, Judge North filed an opinion, with the concurrence of Judge Locke, summing up briefly the history of the contest, and affirming the order appealed from in each of the causes. By this decision the Chollar Company were barred from introducing in the coming trial of the formal suit for ejectment any evidence of property based on their old titles of location, which would insure the defeat of their cause. Even then the indomitable Chollar advocates did not despair, but remained in close communion with Judge Locke until their persistent representations induced him to file an addendum to his decision which permitted them to fight the battle over again from its opening in 1861. This addendum is a legal curiosity, reading:

> It is unnecessary to express any opinion as to the merits of this cause. Both parties may be heard upon the trial as to what was adjudicated in a former trial.[4]
>
> P. B. LOCKE, J.

"Judge Turner thought he had Locke nailed, and to clinch him writes and files the following:"[5]

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[1] Gold Hill News, August 4, 1864; Editorial.

[2] William M. Stewart; Gold Hill News, August 4, 1864; Editorial.

[3] Virginia Daily Union, May 11, 1864.

[4] Records of Nevada Territory, Book A, May 5, 1864.

[5] Gold Hill News, August 4, 1864; Editorial.

Opposing the whole doctrine in the former opinion I concur with Justice Locke in the views expressed in the latter clause, to wit: "That it is unnecessary to express any opinion as to the merits," etc., and that in the final trial before the court and jury both parties should be heard in evidence as to what premises were adjudicated in the former trial, these or others.[1]

GEORGE TURNER, *C. J.*

The Potosi battalion rallied on the day after this addendum was filed, and with Judge North as their ally succeeded in holding a long conference with Judge Locke, while the supporters of the Chollar cause tried in vain to recover control of him, but only succeeded so far as to prevent him from signing a "*retraxit*" of his "addendum" that day. He was carried off, however, in the evening to the town of Washoe by the Potosi Company, and after a week's subjection to the Potosi "arguments" he filed the following order with the clerk of the Supreme Court, May 13, 1864:

You are directed to strike from the files in your office my addendum or qualification to the opinion delivered by North, Judge, and concurred in by me. Said addendum or qualification is hereby revoked by me and rendered null and void and to be of no legal effect.[2]

Given under my hand this the 13th day of May A. D. 1864.

P. B. LOCKE.

Whereupon the editor of the Gold Hill News remarked, with less elegance than truth, "the cake of the Chollar was very cold dough," and added pertinently, "What induced Locke to write that addendum? Certainly no re-examination of the points, for the senseless jargon of that document reveals nothing of the kind, and in fact it is well known that he made no such examination; and then what induced him to sign the *retraxit*?"

This travesty of justice excited general indignation against the conduct of the judges and the contesting parties; but the Chollar advocates managed skillfully to turn the gathering storm against the judges alone. Mr. Stewart had attacked Judge North bitterly in January, 1864, taking advantage of the fact that the judge owned an interest in a quartz-mill, and in order to complete it for service had borrowed $15,000 in

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[1] Records of Nevada Territory, Book A.

[2] Records Nevada Territory, Book A, May 13, 1864.

November, 1863, of William E. Barron, a large holder of Potosi stock.[1] "A judge cannot be useful as a judge," said Mr. Stewart in a public meeting, January 16, 1864, "he cannot be an officer of the people if his business is in such a condition that it requires him to place himself in the jaws of the lions—the Barrons and the Bells. I do not care how innocent his motives may have been. I submit to you whether, if you had your fortunes and your hopes in life pending in a scale before a judge and the opposite party had a mortgage of $15,000 hanging over that judge, you would rest easy in your boots? I do not believe now, and I never believed, that there is a man living who can fill the district judgeship, run a quartz-mill, carry a debt of $60,000, borrow money from litigants, get rock from mines in dispute, and remain a useful judge. I do not believe that the angel Gabriel could do it."[2] Judge North in reply stated that he was ignorant of Barron's interest in the Potosi claim at the time the loan was obtained, and maintained that his ownership of a quartz-mill would not affect his judicial action;[3] but the impression created by this apparent indiscretion was deepened by his action in the Chollar-Potosi case, and by the plain charges of corruption which Mr. Stewart and the leading district journals did not hesitate to make openly.[4]

The pressure brought to bear to obtain the resignation of the whole bench was irresistible. By public meetings and in the columns of the district press they were imperatively called upon to resign: "A most potential cause of the present depression of mining industry," declared a speaker, addressing a great assembly of striking miners, August 1, 1864, "is the deep and universal distrust of our judiciary. It is a fact, flagrant and notorious, that thousands and hundred of thousands of dollars have been expended in obtaining corrupt decisions from infamous judges," etc.[5] The Territorial Enterprise published a petition requesting the judges to resign signed by 3,500 citizens of Storey county, whose names were given,[1] nine-tenths of the voting population, as was alleged. The judges at last bent to the storm. Judge North resigned first, August 22, 1864,[2] and it was hoped by the other judges that this sacrifice might content the people, but they were soon undeceived. On the day when the resignation of Judge North was announced (August 22d) Judge Turner took his seat on the bench as usual, but, after a private conference with Mr. Stewart,[3] he was induced to follow the example of Judge North, and accordingly made a farewell address to the bar, announcing his resignation, and expressing in fair-sounding terms his appreciation of the existing friendly relationship.

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[1] Virginia City Territorial Enterprise, January 17, 18, 1864.

[2] Stenographic Report (Sumner & Cutter) of Speech delivered January 16, 1864; Territorial Enterprise, January 18, 1864.

[3] Territorial Enterprise, January 19, 1864; Stenographic Report.

[4] William M. Stewart; Territorial Enterprise, July 24, 26, August 3, 5, 1864; Gold Hill News, July 25, 26, 27, August 1, 5, 1864.

[5] Speech of Hon. Frank Tilford, Territorial Enterprise, August 2, 1864.

Upon this announcement, and the immediate adjournment of court which followed, Mr. Stewart invited the members of the bar to be present at an informal celebration.[4] After a brief consideration the assembled company decided to remove the solitary figure on the Nevada bench. Accordingly Judge H. O. Beatty was appointed chairman of the meeting by acclamation, and two young lawyers were deputed to wait upon Judge Locke and request the favor of his presence. The committee were instructed by Mr. Stewart to bring the judge without fail, though he hoped there would be no occasion for unkindly suasion. The judge appeared with reasonable promptness, and the chairman of the meeting announced to him that, inasmuch as the majority of his associates on the bench had resigned, it was the opinion of the assembled bar that he ought to follow their example. Judge Locke hesitated, and stammered out a few words, expressing his willingness, personally, to resign, but his doubt whether his duty to his immediate constituents in the county of his residence would permit of his doing so without consulting them. Mr. William H. Claggett thereupon rose and assured the dubious judge that, from his personal knowledge of the sentiments of the constituents in question, nothing could gratify them more than this resignation. The judge cast an imploring look at Mr. Stewart, who, up to that time, had taken no active part in the proceedings. "Mr. Stewart," said he, "what do you think I ought to do?" "Do!" replied the lawyer gruffly, "Resign, and resign now!" Paper and ink were brought at his order by the waiter. "Now sit down and write out your resignation!" The judge obeyed, and thus the bench was cleared of the Territorial judiciary in one day. Then the united company, including the judge, continued the celebration with redoubled fervor.[1]

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[1] Territorial Enterprise, August 10, 11, 12, 17, 18, 19, 1864.

[2] Territorial Enterprise, August 23, 1864.

[3] William M. Stewart.

[4] William M. Stewart.

Mr. North alone of the three judges took action to clear his name from reproach. Libel suits were instituted by him in December, 1864, against Mr. Stewart and the proprietors of the Virginia City Territorial Enterprise. By consent the suits were withdrawn from the courts in September, 1865, and the evidence submitted to three competent referees, Tod Robinson, William H. Rhodes, and George F. Jones. The referees reported "that the evidence introduced failed to show any acts of corruption on the part of the plaintiff, and that his motives in the administration of his office as judge were pure and his conduct in the trial, argument, and decision of causes before him blameless." They censured, however, with just severity, his "conduct in connection with Judge Locke's position in the Chollar and Potosi litigation as unworthy the high position he held, and calculated to awaken suspicion, create animosity, impair his influence as a magistrate, and lower his dignity as a man." While condemning the defendant Stewart and the other libellants to pay costs of proceedings, therefore, they mention as circumstances which palliate their offense "the imbroglio attending Judge Mott's resignation, its venality and secrecy, and the compromising nature of Mr. North's position as judge, mill-owner, debtor, and confidential friend to a leading Potosi partisan."[2]

The excuse which Mr. North offered in explanation of this compromising position, the insufficiency of his salary, was a true plea undoubtedly, but invalid, for he was not constrained to accept the nomination to a seat on the bench. The government allowance of $1,800 yearly as the salary of a justice of the supreme Territorial court[3] was preposterous when compared with the earnings of a competent lawyer anywhere, but especially in the Nevada courts. It is true that this pitiful stipend was increased by a charitable legislative enactment, assigning to the justices at one time a share of the docket fees,[1] and later a fixed allowance of $4,200 severally,[2] but orders upon the Territorial treasury were not cash, as the judges learned to their cost,[3] and even the enlarged compensation was clearly inadequate. No lawyer of the highest standing could afford to accept the judicial position, and only lawyers of the highest standing were fit to preside over the trial of complicated cases on whose issue millions of dollars were staked.

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[1] Territorial Enterprise, August 23, 1864; William M. Stewart.

[2] Report of Referees, dated September 16. 1865; Washoe Times, October 21, 1865; Territorial Enterprise, October 25, 1865.

[3] Organic Act of Congress, approved March 2, 1861, Section 11.

It was not surprising, therefore, that the simple acceptance of a judgship should occasion suspicion of the honor of the incumbent, and this suspicion was certain to become an indignant passion unless his every action was scrupulously guarded. The Territorial bench of Nevada were conspicuously indiscreet. That they were corrupt as well is a charge which only the most positive evidence can justify; yet the attorney general of the State of Nevada did not hesitate to declare in a formal address that "Nevada became a State to escape the dead-fall of her Territorial courts. Her temple of justice had been transformed into a den of iniquity, from which the ermine seldom escapes untainted and justice never unscathed."[4] This was a strongly worded, if somewhat metaphorical, presentment, and may not be justifiable, but it is certain that, with the resignation of the three judges and the installation of a State judiciary, which followed in December, 1864,[5] the fierce excitement of the Washoe litigation was greatly abated. The new bench was composed of able and trusted lawyers who comprehended the difficulties which surrounded their position, and so guarded their actions as to raise themselves above suspicion of corruption. Rival claims were still hotly contested, but the ruling of the courts was respected and resort to open violence in maintaining asserted rights was abandoned. The last hand-to-hand contest recorded took place during the month preceding the resignation of the Territorial bench, when a column of flame and smoke shot up from the shaft of the Gentle Annie Company (July 11, 1864) and the miners of the New Oregon Company heaped up the firebrands from their hostile drift below.[1]

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[1] Act approved November 29, 1861, chap. LIV; Laws of the Territory of Nevada, 1861.

[2] Act approved December 19, 1862, chap. LXXII; *Ibid.*, 1862.

[3] Territorial Enterprise, January 19, 1864; Stenographic Report; Speech of James W. North, Jan. 16, 1864.

[4] Nevada Reports (Helm) No. 4, p. 17; Address of R. M. Clarke, Attorney General, May 13, 1867, upon death of Cornelius M. Brosnan, Justice of State Supreme Court; State Constitution, framed by convention in July and ratified in September, 1864; Thomas Fitch, "Nevada Mines," Harper's Magazine, August, 1865

[5] Territorial Enterprise, December 6, 1864.

Although the black clouds which hung over the titles on the lode had lifted somewhat on the abolition of the Territorial courts, the legal contest was far from being at an end; but the parallel-ledge theory received a heavy blow in the summer of 1864 from the report of John Nugent,[2] an able lawyer, appointed by Judge North, May 17, 1864, as referee in the suit of the Gould & Curry Mining Company *vs.* the North Potosi Mining Company.[3] The location of the North Potosi Mining Company was made April 23, 1860, on an assumed "blind ledge, bounded on the west by the Savage, Gould, and Norcross companies' claims."[4] There was a surface separation of several hundred feet between the croppings of the Gould & Curry claim and the line of this blind ledge, and it does not appear that any objection was made at the time to the location of the North Potosi claim and such work as the members of the company chose to carry on in developing their ledge. It will be remembered that in the spring of 1860 the dip of the Comstock ledge was to the west, as far as was ascertained by exploration, and locations to the east were commonly regarded as wild-cat claims undeserving of serious attention. But when it was made evident by subsequent developments that the pitch of the Comstock ledge had changed to the east, the outlying claims in that direction became more valuable, for if the dip of the ledge should continue in the same direction it would undoubtedly pass under the surface-lines of these claims and might be tapped by sinking shafts within these lines. Accordingly, the North Potosi Company's stock was bought up by shrewd speculators, and their workings pushed until a body of paying quartz was actually uncovered. The company were proceeding to take out the ore when an injunction was prayed for against them by the Gould & Curry Company. The point at issue was of course the existence of distinct ledges—one held by the Gould & Curry Company and one by the North Potosi. If the apparent surface separation was a real one, the North Potosi Company were entitled to hold the ore discovered. If, on the other hand, their ore-body was merely a spur or continuation of that portion of the Comstock ledge held by the Gould & Curry Company, they were "jumpers," in the phrase of the district, "pretended miners," as Saenz calls them,[1] "rascals," in the words of Agricola, "who should be banished from the mines as pilferers."[2] Inclines were at once cut by the Gould & Curry Company to establish their claim of the continuance of their ledge through the ground of the North Potosi and its inclusion of the newly found ore-body. A cloud of witnesses and experts were summoned by both parties to give contradictory affidavits and testimony, and formidable arrays of counsel were pitted against each other.

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[1] Gold Hill News, July 12, 1864.

[2] Virginia City Territorial Enterprise, August 23, 1864; Report of John Nugent.

[3] First District Court Minutes, Book III, p. 256.

[4] Virginia Mining District Records, Book E, p. 126.

In the arguments of counsel before the referee, Hon. Frank Hereford maintained the cause of the defendant and the existence of distinct ledges along the line of the Comstock with a brief and oral plea of uncommon ingenuity and brilliancy.[3] It is probable that no more forcible defense, in view of the facts offered in evidence, could have been made. He cited the apposite decision of Judge North in favor of the Burning Moscow Company, and pressed its applicability to the case in question with the words: "Judge North has practically said that when he sees a separation he knows nothing beyond it; that when he sees a partition like this in a mineral country he cannot ignore it; that when he sees a division he must regard it as a division until the contrary is proved, and the counsel for the plaintiff are asking too much when they ask your honor, by virtue of their theory and their theory alone, to give the parallel ledge to the plaintiff because they believe or they suppose that at some places deep down in the bowels of the earth these two ledges come together."

In the case in question a mighty wall of separation divided the ledges, as he claimed, in the form of a huge mass of porphyry 1,600 feet in length and from 400 to 600 feet in width. By citing, comparing, and opposing the testimony of the various witnesses he vigorously combated the proposition that this immense body of barren rocks could have fallen from the eastern wall of one great lode. "Such a theory," said he in conclusion, "was preposterous on its face and unsupported by evidence. The early prospectors had no such far-reaching notions of the unlimited extent of their claims. They searched for veins, for seams of ore, and their locations were made and recorded for such apparent seams and not for an immense chasm 1,000 feet wide at the surface. To base a claim to the ownership of this chasm on titles derived from them was the height of impudence; to ignore the existence of the great wall of division was an astounding instance of blindness. It is true," he added, "that Mr. Stewart attempted to stable this immense horse, but with very indifferent success; and if the principle be established that such immense masses of rock—such natural divisions of veins—shall be treated as horses, that the veins east and west shall be decided to form parts of one immense vein, formed in an immense chasm, it will be more dangerous and destructive to the interests of this country than was the wooden horse to the ill-fated city of Troy, although it wrapped that city in flames. If this vein is to be so extended in width it is by far the largest vein that ever was heard of in the world, to be accounted for by an unheard-of theory. What is the idea of a vein, for that is what the miners intended to locate, and not a yawning chasm." His plea concludes with an answer to his own question, citing Whitney, Phillips, and other authorities of recognized standing, in the endeavor to prove that a vein is confined between comparatively narrow boundaries by its very definition, and comparing the vein occurrence of the Freiburg district with the characteristics of the Washoe veins.

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[1] Don Joseph Saenz, Tratado de Medidas de las Minas, cap. 7, n. 2.

[2] De re Metall, lib. 1, p. 16.

[3] Virginia City Territorial Enterprise, Aug. 25, 1864; Plea of Mr. Frank Hereford; Phonographic Report.

But the fallacies of this argument were clearly exposed by the arguments of the opposing counsel and by the report of the referee in communicating his decision to Judge North. This last treatise,[1] now practically buried from sight in the vaults of a San Francisco bank, deserves resurrection as the clearest presentation of the characteristics of the Comstock Lode which had up to that time been given. The referee, in the course of his admirable investigation, "stabled the horse" finally, in spite of Mr. Hereford's warning; blew to powder a popular theory of the actual separation of ledges by seams of clay, and forestalled to some extent the conclusions of the eminent geologist, Baron von Richthofen, made public during the following year.

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[1] Report of Referee; Territorial Enterprise, August 23, 1864.

"The line of the fissure of the Comstock vein occurred," he said, "at the junction of two rocks of different character; on the east porphyry mixed with feldspar,[1] and on the west syenite or hornblendic porphyry,[2] a hard, tough rock, wholly dissimilar from that on the east, which is comparatively soft and friable. The western or foot wall of the fissure could be readily traced as a mass of solid, hard hornblendic porphyry, covered generally with a sheet of trap rock on the eastern face, and next to that, between the rock and the vein matter, a selvedge in most places several feet thick, of dark-bluish clay. This foot wall dips to the east at an angle of from 41° to 53° or from 45° to 57°. The critical point evidently is the determination of the east wall. The defendant points to a belt of porphyry running continuously for a distance of 1,400 feet, except where it is broken by 90 feet of quartz, to the west of what is claimed by the defendant as its ledge. Defendant also points to a clay wall, which his witnesses assert runs continuously north and south a distance of 1,400 feet, bounding defendant's claim on the west throughout the entire distance. This belt of porphyry and this clay wall defendant insists constitute an absolute division. Can a clay wall constitute a separation between two veins? Professor Blake[3] and Mr. Thomas[4] swear that it can. No other authority is known for such a position. The unanimous and uncontradicted testimony of authors and experts represents a clay wall as a mere incident to the formation of a vein, and not always even that, but only an occasional accident resulting from mechanical motion whenever and wherever that motion occurs. The only theory verified by the appearance and by the constituents of this clay seam is that of mechanical motion, causing attrition of the walls of the fissure against each other and of the contents of the veins against the walls. There may be some deposition from the surface, the clay being swept into the chinks and cavities of mineral veins by floods or springs; but this can only be true to a certain extent, accounting for some of the masses and bunches of clay found in the veins and not for the more observable phenomena of clay seams. It has been proved that the clay in most of the seams was formed of the rock of the adjacent walls. When the seam passes through porphyry it contains smooth and rounded pebbles of porphyry; when it passes through quartz it contains quartz-grit and rounded pebbles of that material; when it runs through metalliferous rock it bears metal. First, then, we have the chasm in the rock; then the contents of the vein, and then the mechanical violence forming the clay seams. Clay seams, therefore, being formed subsequently to the formation of the vein, cannot be the walls of the vein. Only three of the witnesses believe that veins may be separated by a clay wall—Professor Blake for the plaintiff and Messrs. Thomas and Meyers for the defendant. Let us see the consequences of adhering to such a theory. Mr. I. E. James, a witness for the plaintiff, swears that in the workings covering a belt of two thousand feet north and south from the north line of the Gould & Curry to the south line of the Savage, he found over fifty clay seams running east and west as well as north and south, and dipping at various angles in all directions, and that a number of these are heavier masses than is the defendant's west wall at certain points. Mr. Bonner found large masses of clay in the vein in every form, a net-work of clay seams, from the thickness of a sheet of paper to the width of five and ten feet, running across the ledge, and with the ledge, and cutting it diagonally, as well as bodies of clay twenty and thirty feet thick and a good many feet high. They knot, fork, and run in every direction. They are mere accidental formations in a ledge." The testimony of Professors Blake, Ashburner, Silliman, and others was also quoted in evidence of a similar mode of occurrence of the clay bodies. "A number of witnesses on both sides have testified that in many instances clay seams seen at one level give out at a lower depth and are seen no more, their occurrence being very uncertain, as they appear at one point and disappear at a corresponding point where they might naturally be expected to show themselves. If every clay wall, then, were to be regarded as the wall of a ledge, or as the separation between two ledges, the vein would be cut into numberless pieces—'subdivided,' as Professor Silliman says, 'into innumerable minor portions, a net-work of isolated masses, not distinguishable from each other by any recognizable feature,' and to develop or work these segregated portions would be wholly impossible."

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[1] Recently determined to be diobase.

[2] Recently determined to be diorite.

[3] Prof. W. F. Blake.

[4] C. C. Thomas, Superintendent Sutro Tunnel Company, 1881.

Having thus demolished effectually the theory that a clay seam was or could be a true wall of division, Mr. Nugent proceeded to consider the question whether the belt of porphyry which was alleged to separate the ledges was in reality the east wall of the Gould & Curry vein. "This belt," he said, "terminates in the Savage Company's works, and is there succeeded on the south by a mass of quartz (which Mr. Hereford did not care to notice particularly) 70 feet in length. Thence it runs south, with slighter interruptions of clay or quartz, into the Hale & Norcross works. The foot or west wall of the vein, it will be remembered, has an average dip to the east of 45°. The east or overhanging wall, as it is called by geologists, must have a proximately corresponding inclination it it has remained in place, but as yet no wall has been found with even a remotely corresponding inclination. One of two things, then, must be true; either the original east wall has not remained in position, but has been disturbed and partially displaced, or else it is to be looked for farther east than any explorations have yet been made. If it be farther to the east than the country has yet been opened up, the belt of porphyry west of the North Potosi cannot be the east wall of the Gould & Curry vein. If the overhanging wall has been displaced and has fallen into the fissure, it must have been displaced to the depth of over 500 feet, for at that distance from the surface no wall has been discovered in any degree corresponding in inclination with the foot wall. The displacement of such an area of country would fully account for the masses of porphyry found west of the North Potosi claim. The overhanging wall of the fissure then must either be still standing somewhere, or else its top must have been broken off by force of gravity and fallen in masses into the fissure. Silliman accounts for the masses of porphyry lying to the west of the defendant's claim by saying that, in the production of the fissure, the overhanging rock, being unsupported, has fallen into the chasm in masses, one upon another, and lying against each other in every accidental position, the intervening spaces being filled with quartz in a semi-fluid or pasty condition; and he describes the contents of the vein in many places as brecciated, broken up into innumerable fragments and pasted together again by this siliceous cement. He accounts for the apparent width of the vein near the surface by the hypothesis that a triangular mass falling from the overhanging wall left a chasm wider by ten or twelve times than the mouth of the original fissure. Bonner agrees with Silliman. North of the south line of the Savage mine the belt of porphyry is found generally in masses, without shape or form, ribbed with quartz and seamed with clay—sometimes hard enough to necessitate blasting, again crumbling and friable. Then follow 90 feet of quartz, and then the porphyry appears again. It is very improbable that the wall of a fissure would be found completely broken across by a body of quartz 90 feet in length, connected with another body of quartz (lying alongside), except where it is separated by a narrow ribbon of clay less than half an inch in thickness in some places. The size of the mass of porphyry cannot be regarded as proving anything, for large masses may fairly be presumed to have fallen into a large fissure with an overhanging wall at an angle of 45° or 50°. It is needless to say that in all the mines of the district, the North Potosi as well as the rest, porphyry takes up much greater space than all the other materials combined."[1] In conclusion, the referee, "after a long, anxious, and laborious examination," declared his conviction that the two so-called ledges were parts of the same vein, and adjudged that an order of injunction should be granted to the plaintiff (the Gould & Curry Company) in conformity with the prayer of the bill.

The abstract of Mr. Nugent's report here given is probably sufficient to show the justice of his conclusions; but neither his comprehensive discussion, nor the evidence of subsequent explorations, nor the testimony of such geologists as Richthofen, King, and Church, has yet convinced locators on the eastern ledges that they are "pretended miners."

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[1] As before noted, later investigations have conclusively established the fact that the principal masses of country rock or "horses" imbedded in the fissure have not fallen from the overhanging wall, but have become detached by the lateral and upward pressure to which the rock crust has been subjected, and after their disjunction have slipped or faulted to their present positions.

The principal fighting companies who had borne the brunt of the battle for the ledges were, however, fast becoming tired of waging a costly and apparently interminable war. The profits of their mining operations were swallowed up in ordinary and extraordinary legal expenses.[1] Precisely how much was paid out in this contest cannot be ascertained, as some of the companies have ceased to exist and others are unwilling to furnish the desired information. If their accounts resemble that of the Grass Valley Mining Company this reluctance is natural. By judicial order the books of this company were examined in 1864 by a competent accountant and the result reported to B. C. Whitman, referee, in July, 1864. The account showed that the total assessments were $109,200, of which $39,062.03 were still delinquent, and $70,137.97 were entered as cash received. Of this amount $3,837.48 remained as cash on hand and $66,309.50 had been expended as follows:

Labor account	$5,280 74
Crushing ore[2]	769 34
Loans to a number of persons (names given) who had been witnesses in suits in which the company was interested	12,821 54
Paid to various persons (no particulars given)	6,999 00
Paid to John Doe	500 00
Paid attorney's fees (no name given)	500 00
Paid to Stewart and Baldwin, attorneys	5,000 00
Paid out and unaccounted for	10,587 58

* * * * * * * *

Of the balance, $23,859.30, no itemized account of expenditure was published, though it was stated that loans to several persons covered a portion of it.[3] It is true that the Grass Valley mine was notoriously a fighting claim, so-called, and the relation of the ordinary mine expenses to the extraordinary disbursements was therefore exceptional, but the account is nevertheless significant and illustrative.

S. H. Marlette, surveyor general of Nevada, estimated the amount expended in litigation during the years 1860–'65 inclusive, at $9,000,000, one-fifth of the total product of the mines, and considerably more than was declared in dividends during the same time.[1] Hon. William M. Stewart, a competent judge, agrees in substance with General Marlette. He estimates the cost of the litigation carried on by the Chollar and Potosi Mining companies prior to 1866 at $1,300,000, and the expenses of the Ophir-Moscow war at somewhat less than $800,000. The total costs of litigation in the district up to January 1, 1866, he computes at $10,000,000.[2]

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[1] *Vide* in this connection Albert D. Richardson, "Beyond the Mississippi," Edition of 1865; Letter of Jerome B. Stillson to New York World, dated July 3, 1865.

[2] No entry of results in books.

[3] Mining and Scientific Press, July 30, 1864; from Virginia Union; Report of Accountant to Referee.

These figures were unanswerable arguments against the impolicy of further protracting a suicidal contest. Yet the bone of contention, which had occasioned the overthrow of the Territorial bench and had been a main cause of the creation of the new State, was still wrangled for. It was simply whether a former decision in the suit of the Chollar and Potosi companies was a bar to further litigation based on the old titles. If the Chollar Company gained their point the war with the Potosi Company must be fought over again with a depleted treasury and wasted resources. The Potosi Company was equally crippled and equally anxious for peace. The suit of the Chollar Company was set for trial March 24, 1865, and arguments of opposing counsel were made during the three following weeks;[3] but before a decision was rendered a compromise was arranged which withdrew the vexed question finally from the courts, and a consolidation of the two companies was definitely agreed upon as a basis of settlement on April 22, 1865.[4] The company which was the fruit of this union was incorporated as the Chollar-Potosi Mining Company, on the basis of an equal distribution of shares to holders of the same number of feet in either of the old companies and a joint assumption of the outstanding liabilities of the Grass Valley Mining Company, whose title was transferred to the new company.[5]

The Ophir and Burning Moscow companies were not quite ready to follow the example of the Chollar and Potosi companies and compromise their respective claims.

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[1] Mines and Mining; J. Ross Browne, United States Commissioner, Report for 1866, p. 32.

[2] William M. Stewart, March 15, 1880.

[3] Weekly Stock Circular, March 25, April 1, 8, 15, 1865.

[4] Weekly Stock Circular, April 22, 1865.

[5] A. K. Harmon, President Chollar-Potosi Mining Company, 1880; I. L. Requa, Superintendent Chollar-Potosi Mining Company, 1880.

The rapid advance in the price of Burning Moscow stock on the announcement of the decision of Judge North denying the Ophir Company's application for an injunction has been noted. The price per foot reached $190 on December 28, 1863,[1] and the stockholders were jubilant, but their exultation was short-lived. The ore-body discovered in February, 1863, was small, though extremely rich, and the costs of litigation had swallowed up all the profits derived from its extraction and reduction. At the very moment when its possession was confirmed to the Burning Moscow Company it was no longer worth holding; only the shell of the bonanza remained; the treasure had been wasted. As soon as the stockholders realized this their anxiety to dispose of their shares equaled their former eagerness to obtain them. The levy of an assessment of $15 per foot hastened the fall. In February, 1864, the stock was sold at $70 per foot,[2] declining to less than half its former value in the course of a few weeks. No efforts of the stock bulls could check the depression, and on the 30th of July, 1864, the stock was quoted at $12 per foot with few buyers.[3] The mine appeared valueless intrinsically, and the fickle bulls and bears no longer cared to play battledoor and shuttlecock with its stock. For two months its shares were practically shelved, but during the last week of September they were again eagerly sought for, though no explanation of this demand was granted to the public at large.[4] One thousand six hundred and eighteen shares, more than one-third of the whole stock, were sold at prices ranging from $32 to $75 per foot during this week, and 7,004 shares, nearly double the total stock, were disposed of in open board at rates ranging as high as $92 per foot, in the course of the four weeks ending October 22, 1864, before any tangible reason for the rise in value of the mine had been given.[5] During the following week a little information was suffered to leak out unofficially in the reported discovery of a vein of paying ore, 6 feet wide, at two points, 140 and 200 feet below the surface, and on the strength of this report 1,851 more shares were sold at rates ranging from $59 to $82.[6] The deal had been successfully made, and its managers concluded to prick the bubble. The ore from the new vein was assayed, the result announced, and the stock fell to $20 per foot in a single week, about three-fourths of the total number of shares being thrown on the market.[1] After this fall it seemed improbable that the shuttlecock would be tossed up again for some time, but amid general surprise the game was renewed more actively than ever. A contest ensued such as the stock market had never before known. Nine thousand two hundred and twenty shares, more than twice the total stock of the mine, were sold in three weeks, so that the mine was bought and sold three times during the month of November.[2] What it was worth except as a plaything for stock speculators did not clearly appear, but this was not acknowledged until the following February (1865), when it was tossed aside for some new toy.[3]

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[1] Sanborn's Weekly Stock Circular, January 2, 1864.

[2] *Ibid.*, February 20, 1864.

[3] Weekly Stock Circular, July 30, 1864.

[4] *Ibid.*, October 1, 1864.

[5] *Ibid.*, October 8, 15, 22, 1864.

[6] *Ibid.*, October 29, 1864.

On the 1st of June, 1865, the quoted value of the mine was only $40 per foot,[4] but the Moscow Company had contended so long with its rival, the Ophir, that its stockholders paid the expenses of litigation with a certain proud and bitter stubbornness which refused to acknowledge defeat or admit that they were fighting without an object. Their suit for ejectment against the Ophir Company was set for trial on the 21st of June, 1865,[5] and after thirteen days had been consumed in laying the facts of the case before the jury that body of arbiters disagreed hopelessly, and a new trial was ordered to begin after a recruiting interval of seven days.[6] The result of this repeated trial proved beyond question the wisdom of the compromise between the Chollar and Potosi companies, for under existing conditions it was not likely that a jury could be impaneled which would agree upon a verdict in any mining suit of importance. The scene in court, as sketched by a writer in the Territorial Enterprise (July 14, 1865), is worth preserving. "There is always a crowd in front of the court-house discussing the merits of the case, while those more immediately interested stand hour after hour in the court-room, almost breathlessly earnest in their attention to the evidence of the witnesses and the rulings of the court. Fortune or ruin are the stakes.[1] Glances of triumph give place to scowls of dejection, and these in turn to significant smiles of exultation as the case goes on, and the balance wavers this way or that. Keen eyes and meaning looks are bent upon the jury, and no emotion visible upon the face of any one of them passes unmarked. It is like some desperate gambling game. Participants sit watching every move with eyes as keen as those of a lynx and as angry as those of an enraged tiger. Again and again the character and antecedents of every juryman are carefully dissected and weighed. No stone is left unturned by either side to secure a verdict, and at last, perhaps, the jury will disagree, and all the watching and working must be again resumed."[2] The surmise was correct. After a long deliberation, enlivened by humorous antics, as an observer declared,[3] the jury were discharged on the 22d of July by Judge Burbank,[4]—six holding out for the plaintiff and six for the defendant.[5] "What is to be done next?" was a pertinent query.

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[1] Weekly Stock Circular, November 5, 1864.

[2] *Ibid.*, November 12, 19, 26. 1864.

[3] *Ibid.*, February 18, 25, 1865.

[4] Report of United States Commissioner, J. Ross Browne, 1866, p. 108.

[5] First District Court Minutes, Book 6, p. 225.

[6] *Ibid.*, Book 6, p. 235.

Certain shareholders of the Ophir Company answered it satisfactorily by buying up quietly a controlling interest in the Burning Moscow shares,[6] which, after this last flicker of excitement, fell to $5 per foot.[7] There was, however, an assessment of $15 per foot[8] due on the stock so purchased, 2,724 shares, which the buyers were naturally reluctant to pay; but the board of directors were determined to enforce its collection, and advertised the sale of the shares in question on the 18th of October upon the ground of non-payment of the assessment. On the afternoon preceding the day of sale the holders of this stock went to the office of the Burning Moscow Company to secure its transfer to one Frederic Collier. The secretary of the company refused to make the transfer until the assessment was paid, and the holders applied on the next morning to Judge E. D. Sawyer for an injunction, restraining the Moscow Company from selling their stock. It so happened that the 18th of October was a general judicial election day, and consequently no injunction could be issued, nor had the sheriff power to serve papers.[1] The advertised sale took place accordingly, without opposition, and as there were no other bidders the stock was bought in for a trifling sum by the Secretary of the Moscow Company. On the following day the contesting shareholders obtained an injunction restraining the secretary of the Moscow Company from transferring the stock in dispute to third parties until the legality of the assessment sale should be decided. After some days of parley the contest was ended by a compromise. The Ophir Company agreed to surrender to the Moscow Company the 2,724 shares of stock purchased on its account, and to give besides the sum of $7,500 in return for the section of the Moscow ledge which had been contested for during the past four years. To obtain possession of this section, 800 feet in length, nearly $1,000,000 had been spent, but it was finally purchased by the Ophir Company at a cost, as was estimated, of about $70,000, while its market value at the time was only $50,000. No further commentary is needed to disclose the folly of the laws which allowed a locator to follow the dips, spurs, and angles of his ledge anywhere.

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[1] A curious instance of the infatuation of contesting claimants.

[2] Virginia City Territorial Enterprise, July 14, 1865.

[3] *Ibid.*, July 22, 1865.

[4] *Ibid.*, July 23, 1865.

[5] First District Court Minutes, Book 6, pp. 244, 255.

[6] Sacramento Union, November 8, 1865.

[7] Weekly Stock Circular, September 30, 1865.

[8] Called September 1, 1865; Weekly Stock Circular, September 30, 1865.

The case of the Ophir *vs.* the Burning Moscow is merely a notable and typical example of its class. The number of suits begun in the first district court prior to 1867, in which the leading mining companies were involved, is viz:[2]

NAME OF MINE.	Suits in which company was plaintiff.	Suits in which company was defendant.	TOTAL.
Ophir Mining Company	28	9	37
Yellow Jacket Mining Company	24	8	32
Savage Mining Company	22	7	29
Gould & Curry Mining Company	20	7	27
Overman Company	18	5	23
Chollar Company	7	10	17
Potosi Company	7	8	15
Crown Point Company	12	3	15
Bullion Company	11	4	15
Belcher Company	9	4	13
Sierra Nevada Company	8	5	13
Hale & Norcross Company	2	7	9
	168	77	245

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[1] Law in force in State of California until amended in 1880 by Legislature.

[2] District Court Records.

Of the one hundred and sixty-eight suits in which these twelve companies appear as plaintiffs by far the larger part were actions of ejectment brought to dispossess "jumpers" or to quiet title. If other companies in the district were less harassed it was simply because they had developed nothing worth wrangling for and not because their rights were less questionable. In fact, the titles of the twelve companies named were certainly better than the average, as the claims were of recognized value, and the trustees made unusual exertions to secure the most perfect titles possible.

Yet the mining laws enacted at Virginia City and Gold Hill were not more imperfect than the body of district laws, and their requirements were as carefully observed as was usual. In face, therefore, of such an exhibit the deliberate judgment of the editor of one of the most conservative and influential journals on the Pacific coast is surely justified: "No system can well be worse than that of local resolutions adopted by miners' meetings."[1] This condemnation is the more worthy of note because these same district laws have been absurdly lauded as suited to the needs of the time and the genius of the American people. Such a glorification is sheer folly. The district laws were vague, inadequate, and blundering. They were unjust to the working miner, whose interests they should have protected, and ignorantly or purposely favored the speculator and the sluggard. The centuries of mining experience in Spanish-America were ignored and the common law practice contravened without cause. Instead of being adapted to the genius of the American people they were a clog to its expansion from the outset, and any triumph of mining industry is in spite of them and not by their aid. They should have been canceled at the earliest possible moment by a well framed National or State code, but Congress was inactive and the Legislature of Nevada preferred to patch up the worthless system rather than to supply a fitting substitute.

Some of the more evident needs of the mining district had been recognized in Territorial Acts. To confirm existing titles a statute of limitations was passed in 1861, providing that no action for the recovery of mining claims should be maintained unless it should appear that the plaintiff or his assigns were seized or possessed of the mining claim in question two years[1] before the commencement of such action.[2] As this provision did not estop claimants from bringing suits against corporations organized outside of the Territory of Nevada, little relief was derived from it by the companies holding mines on the Comstock Lode, most of whom had been organized in California, and its immediate effort was probably to swell the number of suits affecting mining companies in the First District Court to 217. The necessity for a more general protection was fully demonstrated in later years when bonanzas were developed in unproductive claims. Then a troop of contestants who had lain hidden like the dragon teeth of fable started up in battle array and began to attack the men who had spent fortunes in piercing the barren lode. But it was not until February, 1879,[3] that corporations and citizens of other States were formally declared to be entitled to all the privileges and immunities of Nevada corporations and citizens.[4]

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[1] San Francisco Alta-California, February 16, 1867.

A more useful provision was the act passed in 1862 regulating the conveyance of mining claims, which should thereafter require the same formalities and be subject to the same rules of construction as the transfers and conveyances of other real estate.[5] Such a law was most urgently needed, but it was an irreparable misfortune that it had not been operative during the two preceding years, for the evil results of the loose conveyancing by parol transfer and otherwise were often beyond remedy, and the act of 1862 was, in so far, merely locking the stable door after the horse had been stolen.

These measures of relief were confessedly insufficient. No title to the mineral lands of the district could be conveyed by Territorial or State legislation. The Comstock Lode companies held their mines therefore by tacit consent of the nation, or possessory title merely, until 1866, when the first general mining law was enacted by Congress.[1] By this act mine holders were confirmed in their possession acquired under the district laws and permitted to acquire a certified title by patent from the United States. In so far the law was most desirable, but it fell far short of being the complete code which should have been adopted, for prospectors were still permitted to organize districts, elect officers, and parcel off the mineral lands of the nation with inexperienced hands. The extent of the claim which could be located by one person or association of persons was limited, it is true, but the restriction could readily be evaded. There was no guarantee of the character or competence of the district recorder, and he was responsible to no recognized authority, unless the shifting, careless body which elected him can be so termed. Furthermore, the litigious provision of the district laws which allowed a locator to follow the dip of his lode indefinitely and granted him the ownership of all its spurs and angles was still left operative, and this most objectionable infringement of the rights naturally acquired by locators under the common law was thus strangely countenanced. "If we were to give laws to a nursery," wrote Goldsmith, half seriously justifying the ball-room code of Beau Nash, "we should give them childish laws;" but the analogy must not be misinterpreted. Clear, just, and simple laws may be childish in the sense that even children can comprehend them, but it by no means follows that children would be able to frame them; yet it would be nearly as sensible to allow children to legislate for their own government as to permit uneducated miners of limited experience to parcel out the mineral lands of the country and then to compound their district regulations into a code of universal application.[2]

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[1] Statutes of Nevada Territory, 1861, p. 27. Statutes of Nevada, 1867; re-enactment of this provision.

[2] Amended by act of the State Legislature, February 27, 1869, substituting the word "five" for "two;" Statutes, 1869, p. 95.

[3] Statutes of Nevada, 1879.

[4] Eight suits were filed against the Consolidated Virginia Mining Company, in Nevada, during the year 1878, six of which were decided during the year in favor of the company, and two were still pending at its close.—(Annual Report Consolidated Virginia Mining Company, 1878, pp. 6–8.) Yet, whenever any claims of pretended original locators had any show of justice, suitable compensation was made by Mr. John W. Mackey, individually, who filed with the County Recorder, December 9, 1877, quit-claim deeds in full for his purchases to the Consolidated Virginia Mining Company and the California Mining Company for the nominal sum of $1 each.—(Territorial Enterprise, December 9, 1877; George R. Wells, Trustee, Consolidated Virginia Mining Company, 1878.)

[5] Statutes of Nevada Territory, 1862.

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[1] An Act granting the right of way to ditch and canal owners over the public lands, and for other purposes. Approved July 26, 1866. U. S. Stat., vol. 14, p. 221.

[2] The Act to promote the development of the mining resources of the United States, approved May 10, 1872, was carefully drawn, and contains important amendments and additions to the Act of 1866. Yet it is justly criticised as still permitting the miners of any district to enact laws governing the location and working of mining claims, under certain limitations, and to intrust the duty of record and supervision to their own appointees, except when otherwise provided by State or Territorial legislation.—(Act approved May 10, 1872, Sec. 5.) The litigious provision allowing locators to follow the dip of a lode indefinitely was also retained.—(Act approved May 10, 1872, Sec. 3. U. S. Stat., vol. 17, p. 91.)

CHAPTER IX.

INDUSTRIAL CONFLICTS.

The resignation of the Territorial bench took place during a period of general depression of mining interests and values in the Washoe district. The rich superficial deposits of the Gould & Curry, Ophir, and Savage mines had begun to show plain indications of exhaustion, and the best-apprised stockholders endeavored to dispose of their shares quietly while their market value was only slightly impaired; but the facts could not be concealed and the inclination to sell became general. More shares were thrown on the market than could be taken up by the available speculative capital, and the inevitable result was that the prices of all stocks, good and poor, fell with an irresistible impulse. Thousands of shareholders were impoverished and hundreds were ruined. Gould & Curry mining stock, which on the 1st of July, 1863, was quoted at $6,300, and on April 1, 1864, was still worth $4,550 per foot, fell in four months to $900 per foot[1] (quotation July 30, 1864.); Ophir stock fell from $1,580 per foot on April 1st to $300 on September 20, 1864, and the shrinkage in the value of Savage stock was equally large, as it was quoted at $2,600 per foot April 1st, and at $750 per foot July 30, 1864.[2] The shares in other productive mines suffered a corresponding decline, and wild-cat stocks fell so low that they could not be resurrected.

The great majority of the shares were held in California, and the effects of the depression were, of course, visible in San Francisco; but it was in the immediate vicinity of the mines that the prostration of industry and general suffering were most strongly marked. Work on many claims was virtually abandoned; miners were thrown out of employment, and the burden upon the productive mines even was felt to be so heavy that there was a general call for the reduction of expenses. Pressed by this demand the superintendents of the different mines began to look after possible leaks in their revenues more sharply. Useless employés were dismissed, the timber and fuel accounts were more closely scrutinized, and finally a general though quiet movement was made to bring about the reduction of wages.

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[1] Weekly Stock Circular, July, 1863, April, July, 1864.

[2] Gold Hill News, November 15, 1864.

This last proposition, while yet only broached tentatively, excited a formidable and active opposition, for the miners of the district at once arrayed themselves against the measure. They were an orderly, quiet, hard-working class as a rule, but they clung tenaciously to an arbitrary standard of compensation, and were as ready to fight for it as if it had been an inalienable right, confirmed by divine law and custom from time immemorial. Most of them had suffered directly from the shrinkage in stock values, as nearly all were small holders of shares, and they recognized the need of economy in working the mines during the period of depression at least, but they wished the saving to be made in some other way, not clearly indicated, than in the reduction of wages. They preferred to see claims abandoned, mines deserted, and workmen everywhere discharged rather than consent to this proposition. It is true that they offered some defense for their apparently blind obstinacy. They contended that any departure from the standard was fatal to their principle of a "fair day's wages for a fair day's work." They had estimated that $4 per day, or shift, was this proper compensation, and this estimate had been tacitly admitted during the past four years in the Washoe district. If the rate of wages was reduced to $3.50 per day, as was proposed, they thought it unlikely that it would ever revert to the former standard, and believed that this comparatively small reduction would be an entering wedge to a series of clippings. "If $3.50, why not $3, $2.50, $2, or even $1?" they said. "Our only protection is in warding off the first blow. We can better afford to have half our force leave the district and seek new fields of labor than to run the risk of endangering the future welfare of all." So strong was this feeling that the discharged miners preferred to leave the district even, or to live on their scanty savings, or from hand to mouth, rather than to accept a diminished rate of pay.

Whenever the miners' principle of a fair day's wages for a fair day's work is reconciled with the operation of the economic law of supply and demand the insoluble labor problem will be solved. The miners on the Comstock cut the Gordian knot by arbitrarily establishing a minimum rate of wages, destroying, of course, the normal relation between the variables by this introduction of a constant quantity. They offered no arguments except their personal opinions to prove that the sum of $4 was more nearly a "fair day's wages" than $3.50 or $3, but they made their position impregnable by means more cogent than logic or economic principles. Their standard was set, and economic arguments have battered it for twenty years in vain.

On the 30th of May, 1863, a company of from 300 to 400 miners had assembled in Virginia City and passed resolutions, informally, "that the organization of a Miners' Protective Association be forthwith commenced," and "that lists be prepared and kept open one week. The objects of the proposed association were averred to be the "securance to practical miners of a good remuneration for their toil, the exposure and defeat of speculative plans affecting their interests injuriously, and the providing of aid and comfort for them in times of sickness and adversity."[1] The organization was not completed, as the times were prosperous and the need for its existence not generally recognized; but the movement was an indication of a prevailing sentiment which would be formidable if rendered active.

For several months the temper of the miners was not tried. Conscious of their collective strength, even without organization, they were indolent in its exercise, and overlooked petty attacks upon their standard of wages with contemptuous patience. If they struck back at all it was with the good-humored buffet of a tame bear teased by children at play, showing his teeth just sufficiently to make the warning effective. So, when the pay of miners in the Uncle Sam mine was reduced from $4 to $3.50 per day, and the new foreman, John Trembath, a stalwart Cornishman, was believed by the miners to have been an active agent in effecting the change, a resolute party seized upon him (March 19, 1864) in one of the lower levels of the mine and bound him hand and foot in spite of his struggles.[1] Then they wound a coil of rope round him till he looked, in their eyes, "like an Egyptian mummy," and lashed him firmly to the main hoisting-cable of the shaft. A label was fastened to his body, reading, "Dump this pile of waste dirt from Cornwall," and the signal was given to hoist and lower him twice. It was a fresh sensation, undoubtedly, to be jerked up suddenly from the midst of a lighted ring of broadly-jeering faces into the dark pit of the shaft, there to bump about, helplessly dangling at the end of an elastic hemp rope; but Trembath was nevertheless well pleased when he was hoisted to the surface, dumped, and unbound. He denied that he was in any way instrumental in bringing about the reduction of wages—probably with truth, as miners are commonly suspicious of novelties, and might have readily mistaken the concomitant changes of foreman and wages for the directly-related changes of cause and effect. Innocent or not, he served as a convenient 'scapegoat for the managers of the Uncle Sam Company, and the insubordination of the miners was passed over without notice. Still the warning was not heeded, and as stocks fell during the early summer, the disposition to reduce expenses by cutting down wages was daily more manifest. Men were engaged quietly at rates below the old standards, and the leaders among the miners, seeing that a general reduction was impending, resolved to act promptly. The alarm was given and the sluggish body was stirred to action at once. On the evening of July 31, 1864, a long procession was formed, including in its ranks nearly all the miners and mill-hands of the district, and marched through the streets of Virginia City and Gold Hill, headed by a band of music playing all the defiant airs in their score-books.[2] The column swayed from side to side, opening and closing gaps as the sections moved on, clearing a broad way for their passage. The watchword ran along the line, "Four dollars a day!" shouted by stentorian lungs every moment, with a continual chorus of vociferous cheers. There was no rioting, no threatening turbulence, no bitterness of feeling apparent. The men joked, laughed, and shouted, fearing and meeting no opposition. In front of the International Hotel the column halted, filling the street in front of the balcony with its thronging mass. In response to repeated calls a popular speaker, Hon. Frank Tilford, addressed the crowd from the balcony of the hotel, calling upon them to act with calmness and forbearance; for he recognized beneath the noisy good humor of the men a fixed determination to enforce their demands at all hazards. In this determination he sympathized, apparently, but endeavored to content them with florid rhetorical images in place of flesh-and-blood opponents. "To reduce wages," he said, "is to drive to despair and death the miner and his family. It cannot and must not be. By the law of ancient Rome a convicted traitor was hurled from the Tarpeian rock. Let the man who in this crisis advocates a reduction of miners' wages be girdled with burning faggots and receive the fate of the Roman felon!"[1] Though it was not clearly apparent to every one present that despair and death were included in the proposed reduction of 50 cents, no one cared to win a girdle of faggots or its Washoe substitute by confuting the assertion.

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[1] Territorial Enterprise, May 31, 1863.

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[1] Territorial Enterprise, March 22, 1864; Gold Hill News, March 21, 1864.

[2] Gold Hill News, August 1, 1864.

After the customary sacrifice of speeches the mass-meeting adjourned by an informal scattering of its members; but on the next morning (August 1, 1864) an orderly body of many hundred men visited the mines and mills and made a formal appeal for uniform wages of $4 per day. As there was no definite plan of coöperation in denying this demand, open resistance was judged to be futile and dangerous, and the desired concession was made by the representatives of all the mine and mill companies without exception, it is said.[2] Five days later, on the evening of August 6th, the miners again met in a body and completed the organization of a Miners' League.[3] A president, vice-president, secretary, treasurer, and board of seven trustees were elected, and a constitution and by-laws of the "Miners' League of Storey County" adopted. By the laws of this society every member was required to pledge his word of honor "never to work in the county of Storey for less than $4 per day in gold and silver coin." Every member must help his fellow members in preference to outsiders, and give immediate information to the secretary of the league upon learning that men are at work in the county of Storey for less than $4 per day. Upon receipt of this information "the secretary shall notify the president of the fact, the president shall call a special meeting of trustees, the trustees shall remonstrate with the employers, and if such remonstrance is disregarded the president shall be required to call out the entire force of the league"—a sufficiently expressive conclusion.

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[1] Territorial Enterprise, August 2, 1864. [2] Gold Hill News, August 2, 1864. [3] *Ibid.*, August 8, 1864.

Although the concession of a uniform rate of $4 per day had been made, yet it was regarded by some of the mining companies at least as a temporary bargain, wrung from them under protest, and concluded with certain mental reservations. When the excitement had subsided unemployed miners were quietly engaged as before, under secret agreements, and an opposition which could not be confronted was thus insidiously sapped. The representative journals of the district—the Virginia City Territorial Enterprise and the Gold Hill Daily News—took part with the miners warmly,[1] making common cause against the Californian capitalists, who, in the temper of the day, were regarded as aliens and avaricious money-lenders. It was forgotten for the moment that the mines were developed with alien capital, and that the prosperity of the district was largely due to the sanguine investors, who drew unremittingly from their purses to tide over periods of depression. The people of the district, with natural selfishness, were disposed to throw the whole burden of the hard times upon the shoulders of others, and were inclined to grumble if the Californians refused to carry the over-weighted load.

This bit of human nature was justified on the plea that there was no sufficient reason for the reduction of wages, as the value of the mines was never intrinsically greater than during that summer of 1864, and the export of bullion from Nevada was far larger than at any former period. If, in face of these facts, a contraction of expenses was necessary it should be brought about by economical management, careful milling, and incorruptible honesty. These expedients, it was urged, would injure only knaves and drones, and when these were shown to be insufficient, it would be time to consider the question of resorting to a reduction of wages. This was in accord with their "principle" that any change affecting the condition of the laboring class prejudicially should be postponed until it became unavoidable.

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[1] Territorial Enterprise, August 16, 1864; Editorial; Gold Hill News, September 21, 1864; Editorial.

The point at issue was the determination of this last period. The leading stockholders in the several companies maintained the undeniable fact that the actual export of bullion was no criterion of the real value of the mines, if the speedy exhaustion of the known ore-deposits was foreseen. It was this prospect of impending exhaustion which had caused the sudden fall in the prices of stocks, and capital could not be made less timorous by ill-supported assertions of prosperity. A reduction of expenses was urgently demanded as the only available means of upholding even the ruling low prices of mining stocks and providing for the further developing of the mines. In curtailing expenses a rate of wages which was allowable in bonanza times could not be maintained in a season of borrasca. A reduction of wages, therefore, was an integral part of the plan of reduction which was being carried into effect, and this measure could be delayed no longer.

Here was an irreconcilable conflict of opinions whose issue it was not difficult to predict. An arbitrary standard of wages could only be maintained by force. It was useless to attempt to constrain the expenditure of capital in a period of depression, though this can sometimes be done in a time of prosperity, when a contest may imperil otherwise certain profits, and reckless declarations of the independence of labor were simply untenable. "If mines," wrote the editor of the Territorial Enterprise, August 16, 1864, "cannot afford to pay $4 a day to miners, let them lie still; for they will do the Territory little good and their stockholders less." Such an assertion was, of course, simply absurd, but utterances like these, supported by the consciousness of the real weakness of their position except when confronting openly declared opposition, finally induced the miners to hazard a rash step.[1] A meeting of the league was held on September 18th, in the district court-room at Virginia City, and a resolution passed authorizing a committee to notify the employés of the mills and mines of Storey County that no persons except members of the league should be permitted to labor in the mills and mines after Tuesday, September 27th, instant.[2] In accordance with this vote the committee of three appointed published notices and posted them in conspicuous places; but it was easier to paste up notices than to carry their injunctions into effect. A considerable proportion of the miners of the district did not belong to the league, and were not disposed to be bullied into joining that body, while strongly, if covertly, supported as they were by the superintendents of the several companies. The notice was somewhat too peremptory also to suit a general sense of justice and the privileges of personal independence, which the members of the league were never willing to disregard absolutely; yet it appeared probable, at first, to many lookers-on, that the dictum would be enforced, for the power of the miners united had been recently displayed. The editor of the Gold Hill News wrote (September 21st), with an eye to the result of the contest: "We admit that it seems a little hard that employers shall not employ just whoever (*sic*) they please on their own property, but this is the land of Washoe, *and if labor isn't king here, we really do not know who is.*"[1]

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[1] Gold Hill News, September 19, 1864.

[2] *Ibid.*, September 22, 1864.

This was a little too much even for the strong stomachs of the league. The rate of wages was still nominally $4 per day, and if a lower price was paid the bargains were covert. Probably a majority of the miners outside the league were still receiving $4 per day, and they regarded the fees of membership exacted by the league as an unnecessary and unwarrantable tax; so they flatly refused to join the league, and compulsory membership could not be enforced. A special meeting of the trustees of the league was accordingly held on the 22d day of September, and a resolution passed deliberately withdrawing from their untenable position.[2] The responsibility for the obnoxious notices was shrewdly thrown upon the shoulders of the special committee of three, and the trustees "begged leave to assure the superintendents and owners of mills and mines that no illegal action shall be had whatever," and to declare "in general that the object of the league is to secure the best interests of the miners peaceably." The special meeting appointed for the 27th of September was postponed until the regular monthly meeting. On the following day the Gold Hill News recognized the changed aspect of affairs by an equally sudden change of base. "When the full scale of prices is paid by the superintendents it is certainly all that can be asked of them by any society. A step beyond that is infringing upon rights which cannot under the laws of the land be invaded. * * * We remarked day before yesterday, in our article on the league movement, that Labor is King in Washoe. We used a figurative expression, and will here amend it. Labor is king provided the king behaves himself and does not trespass upon other vested rights."[1] The absolute sovereignty of September 21st had indeed become a limited monarchy on September 23d, but the attempt to reconcile the two positions was an impossible feat which journalists feel constrained sometimes to attempt for the sake of consistency and subscribers.

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[1] Gold Hill News Editorial, September 28, 1864.

[2] *Ibid.*, September 23, 1864.

The failure of the prohibitory notices proved a decided check to the assumptions of the league. It had acknowledged its powerlessness to prevent the engagement of non-members as laborers in the mines, and its members soon noticed that they were being quietly and consistently dropped, one by one, from the list of employés, and that their places were filled with miners who were known to be unattached to the league. The very existence of their body was threatened unless this weeding-out process was stopped, yet they were powerless to resist it effectually, for the superintendents of the mines had an undisputed right to employ any laborers they pleased at wages of $4 per day, and they were naturally disposed to weaken their formidable opponents as far as possible and to diminish the danger of organized strikes by giving the preference in engagements to men not members of the miners' societies. They were willing to pay the full rate of $4 per day even to such men, until the league was effectually weakened and incapable of resenting a reduction of wages. The league members, therefore, seeing the shrinkage of their relative power daily, began to ask themselves what was to be gained by the maintenance of their organization. Its disadvantages were evident in the manifest black mark attached to its membership by the superintendents and the necessity of paying a regular monthly assessment, which soon appeared to be a tax upon disqualification for employment in the mines. Many members accordingly ceased to pay their monthly dues and withdrew from the organization in fact, if not by express avowal; the monthly meetings were ill attended, and the once powerful society ceased to be formidable to any one. The contest, or undermining process rather, had been shrewdly conducted by the superintendents without any avowal of their ultimate intention; but finally, seeing that opposition was effectually prostrated and that the time was ripe for the change, the pay of the ordinary miners in the leading mines in Virginia City, the Chollar, Potosi, Savage, and Gould & Curry, was reduced to a uniform basis of $3.50 per day, in the spring of 1865.[1] The measure had been so skillfully introduced that its enforcement excited no protest worth mentioning. Discontented miners left the district, or concluded to accept work at the new rate as the only remaining alternative, and thus a proposition which would have entitled its mover to a rhetorical "girdle of faggots" six months before was carried into effect without a suggestion of martyrdom or even of burning its makers in effigy. Yet this concession to the inevitable was not intended to be final. The miners did not care to kick against the pricks, but were not disposed to concede the point at issue, the right of the superintendents to define the rate of wages paid to the different classes of workmen, for they did not forget that the former standard of $4 per day was fixed by custom during four years and by their authoritative declaration on the 6th of August, 1864. Still, though the deduction of one-eighth from their pay was a considerable loss to men with families, the change could have been borne without marked inconvenience, and if the Miners' League had established the rate of $3.50 per day it would have endured to the present day (1881) without question.

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[1] Gold Hill News, September 23, 1864; Editorial.

Meanwhile, in spite of the interminable litigation, ignorant and extravagant wastefulness, and conflicts between labor and capital, the industries of the district were persistently developing. The energies of American mining enterprise may be ill-directed, squandered, and rebuffed, but they are rarely exhausted or finally foiled. The importance of a convenient access to the district from the Pacific sea-board was clearly realized, and not only must the demands of the growing cities on the lode be satisfied, but the needs of outlying districts throughout Western Utah, which had sprung up under the magic touch of the miner's pick, must also be provided for. The influence of the discoveries of the two Irish prospectors was already far reaching.

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[1] Territorial Enterprise, August 23, 1865.

The two main routes across the Sierras were through Johnson's Pass and Henness Pass, entering Sacramento by the way of Placerville and Nevada City respectively. An extraordinary change was wrought in the condition of both these roadways, especially in that of the former. During 1861 and 1862 toll-road grants were obtained, and a small army of laborers was at work on both slopes of the range from foot to summit.[1] The steepest grades were cut down and smoothed; gullies and ruts were filled with compact layers of broken stones and loam; bordering rocks were blasted away or rolled aside, and the narrow, dangerous, wretched trail, scarcely fit for the passage of sure-footed pack-mules, became a broad, compact, well-graded highway, which might fairly be likened to an old Roman road.

The stage-coach ride across the mountains, which had been a "torture," became a pleasure. As the traveler approached the summit of the range, new landscapes of wonderful beauty met his eyes at every turn. Swift-falling streams broke in foam at his feet, and the forest stretched its protecting arms over his head and filled the air he breathed with fragrance. Below its dark-green mass lay the fresh turf of valleys studded with daises and buttercups, where sleek red cattle rested content, and in the heart of the hills was outspread the deep waters of Lake Tahoe, whose blue waves have the many-dimpled laughter of the sea. Above the tree-belt towered bare weather-beaten crags with tawny-brown pinnacles, or snow-capped ridges outlined sharply, like silhouettes, against the cloudless sky, and far away, at the verge of the horizon, the brown desert plains and treeless ranges, with their fleecy mantle of haze, were a neutral-tinted framework to this memorable picture.

The turning points of the road were broad platforms built up from the hill-sides with outward-curving base-walls of well-joined rocks. On the level surface of these bastions an eight-mule team could turn without slacking their traces, and loaded wagons could pass one another at all points on the road without difficulty. When snow-drifts blocked the passage in winter, a well-equipped party of men and horses sallied from every station and cleared the way with extraordinary dispatch, while watering carts, passing from station to station, laid the dust in summer, so that the road was like a well-kept avenue in a mountain park. Fully $500,000 was expended upon this macadamized highway across the Sierras from Virginia City to Placerville, a distance of 101 miles by road, or about $5,000 per mile, and the cost of constructing certain portions of the road was, of course, much in excess of this average estimate, and the expenses of maintenance were correspondingly large.[1] From Strawberry Valley to the West Summit, a distance of 10 miles, the road was cared for by the toll-gate grantees, Swan & Co., whose yearly outlay was from $2,000 to $3,000 per mile, and the expense of maintaining the highway from the West Summit into Lake Valley and thence over the East Summit into Carson Valley was equally great. Snow-drifts, mountain torrents, the wheels of ponderous carts, and the hoofs of tramping mules were destructive agencies which were combated indefatigably; but the toll-road owners could well afford to carry on an expensive contest, for their reimbursement was ample. A toll-gate was far more profitable than an ordinary mine. The receipts of Swan & Co. were from $40,000 to $70,000 annually, and their road only extended over one-tenth of the distance between Placerville and Virginia City.[2] The tolls paid for the passage of a four-horse team from Sacramento to Virginia City, the principal shipping points, aggregated $14.87½ in August, 1862, and for every additional animal an aggregate charge of about $1.50 was imposed.[3] Upon the return trip the tariff was sometimes half-price, and at some stations no toll was exacted. In 1860–'62 four and six-mule teams were commonly employed; but, as the grades were made low and the roads improved, ten, twelve, and even fourteen and sixteen-mule teams came into general use. They stretched along the highway for miles in an unbroken procession, and if a teamster by chance fell out of line he would often be compelled to wait for hours before he could regain a place in the column. Oxen were rarely used as draught animals, as their motion was too slow to suit the sierran teamsters, and horses could not well endure the labor and exposure, but mules answered the requirements perfectly. These sierran mules were not the gaunt, back-sore, vicious creatures which infest some of the Southern States, but sleek, strong, well-fed animals, tossing their heads gaily to the accompaniment of jingling bells, and pulling the ponderous wagons easily over the firm road surface. The drivers were proud of their teams and spared no pains to keep them in fine condition. The sweating mules were rubbed down carefully at night, assiduously curried, supplied with pure water in abundance, and fed on the choicest oats, barley, and hay.[1] In consequence of this treatment the animals were always vigorous and capable of dragging the extraordinary loads which were piled upon a train of carts fastened to one another by the useful "back-action" attachment. The amount of freight apportioned to every animal advanced from 1,000 to 2,000, and even 3,000 pounds—a ten-mule team frequently dragging from 10 to 15 tons.[2] The number of teams engaged increased even more than the loads. The 400 teams employed in 1860 received an addition of 200 in 1861,[3] and in 1862 the total number was said to be 950.[4] In subsequent years this number was nearly doubled, and the amount of freight transported across the Sierras rose to scarcely credible figures.[5] In 1862 the Central Pacific Railroad Company placed an agent in Strawbery Valley, who made an accurate list of the number of stages, stage passengers and other travelers, private conveyances, stock of all kinds, freight teams, and pounds of freight passing a given point on the main road during a period of eight weeks. The number of pounds of freight hauled was 19,386,200, the number of teams employed was 2,772, and the number of horses and mules was 14,652. The chief engineer of the same company, in his report to the directors in October, 1862, estimated that 43,800 tons of freight were hauled over Johnson's Pass alone yearly, which, at the average price of 6 cents per pound, would make the total freightage expense $5,256,000. His calculation was apparently based on the returns of the inspecting agent, and was clearly an overestimate, for during the eight weeks in question nearly one-third of the total freight for the year was carried. No complete and trustworthy records have been made by which the yearly aggregate can be computed exactly, but an estimate founded on toll-book records and the evidence of persons engaged in the work of transportation fixes the amount at 25,000 tons in round numbers. At 5 cents per pound, a computed average, the amount paid to teamsters and shippers in 1862 would be $2,800,000, which is probably a close approximation to the actual charges. A four-horse or mule team, which made the round trip in sixteen days usually, was charged $22.75 at the toll-stations, and the driver of a six-mule team paid $30. According to a careful estimate at least $300,000 was collected by the toll-gate keepers during the year. Returns showed that the average number of passengers carried daily by the stage lines was 37, or 13,505 in all during 1862, and the receipts at $30 per head were $405,150. In the following year the editor of the Sacramento Union asserted that the freight and receipts from all sources were more than doubled;[1] but this was beyond question an overestimate, though the travel over the pass had largely increased. A record from the books of one of the three stage lines, the Pioneer Stage Company, showed that 11,103 passengers were carried over Johnson's Pass from California to Nevada in 1863, and 8,430 passengers from Nevada to California the same year.[2] At $27 per head, the advertised rate,[3] the receipts of the company amounted to $527,391, exclusive of the allowance for mail service. The California Stage Company and the Nevada Stage Line transported over the Henness Pass route about half as many passengers as were carried *via* Placerville, so that the aggregate receipts of the lines, including the amount paid them for postal service, would not fall far short of the estimate made by the editor of the Union, $1,000,000.

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[1] Sacramento Union, August 2, 1862, May 13, 1867; Mining and Scientific Press, June 22, 1861, March 3, 1877; Comstock Papers, No. 19.

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[1] Mining and Scientific Press, June 22, 1861.

[2] Account Books of Swan & Company, Strawberry Station.

[3] Sacramento Union, August 13, 1862.

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[1] Sacramento Union, July 15, 1861.

[2] Records obtained from officers of the Teamsters' Association. 1863-'67.

[3] San Francisco Evening Bulletin, April 12, 1862.

[4] *Ibid.*, October 2, 1862; Carson City Silver Age, August 17, 1862.

[5] Sacramento Union, November 25, 1863; Editorial.

Records obtained from the toll-stations and from the officers of the Teamsters' Association show that the number of freight teams regularly employed from 1863 until the completion of the Central Pacific Railroad across the Sierras was about 1,400, and that the freight transported annually from California across the Sierras ranged from 45,000 to 70,000 tons. The number of draught animals in service was from 12,000 to 15,000, and the teamsters, hostlers, and others in charge of this great troop numbered more than 2,000 men. The Pioneer Stage Company alone employed 53 men as drivers and hostlers in 1864, having 12 fine coaches on the road and 600 horses in their stables.[1]

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[1] Sacramento Union, November 25, 1863.

[2] Virginia City Territorial Enterprise, June 16, 1864.

[3] Territorial Enterprise, March 18, 1863.

From daybreak to sunset this sierran caravan traversed the mountain passes in long files. Bells jangled, whips cracked, drivers shouted and swore, mules tugged and snorted, horses pranced, lumbering carts creaked and swayed, and mail-coaches rattled down the grades at full speed, threading the slow-moving lines which parted to give them free passage. Ninety-three hotels and lodging stations were erected on the Johnson's Pass route before the summer of 1864,[2] and their yards were centres of bustling life three times a day. Drivers, hostlers, hotel keepers and passengers shared the excitement of this animated scene. Rivalry kept all alert, and the untiring energy to which the Territories of the West owe their astonishing development was here most vividly displayed. Slowness and indecision were more hateful than positive vices; to be behind time was an offense which could scarcely be palliated and the universal watchward was hurry. The schedule time by stage from Virginia City to Sacramento was reduced to 18 hours, and special coaches with many relays of horses made the trip in 12½ hours.[3] The drivers were expected to rival Jehu, and did not disappoint their passengers. The same excitable spirit which blew up steamboats on the Mississippi overturned coaches on the edge of mountain precipices; yet the victims bore these incidental casualties without a murmur. Thus, when the Henness Pass stage rolled down a steep hill into the Truckee River, July 22, 1863, killing one man and injuring seven others, the driver was held blameless,[4] and when a Johnson's Pass stage toppled over the brink of an embankment a month later (August 25, 1863), and the falling wreck was stayed by chance in the spreading arms of a large pine tree, the bruised passengers looked down upon the bottom of the abyss, 1,000 feet below, and congratulated themselves on their good fortune without censuring the coachman even in thought.[1]

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[1] Territorial Enterprise, June 16, 1864.

[2] Gold Hill News, June 20, 1864.

[3] *Ibid.*

[4] Territorial Enterprise, July 24, 1863.

The majority of these accidents were clearly the result of carelessness, but some were incident to the nature of the mountain region. It is difficult to see, for instance, how the approach of the grizzly bear could have been foreseen, which charged over the road in front of a moving coach on a May evening in 1864, whereupon the lead-horses, in sudden terror, reared and rushed back toward the coach, breaking the pole and causing the startled passengers to leap out and off in all directions.[2] This was merely an episode of sierran travel, and much less frequent in occurrence than the attacks of stage robbers. These masked desperadoes, well-armed and well-trained in their duties, posted themselves in ambuscade at convenient points and attacked the coaches so suddenly that resistance was generally hopeless. If the driver failed to stop his horses when ordered, a well-directed bullet spared him the trouble, for the team could not move far with a dead or dying beast in the traces. Then the passengers left the coach meekly, in face of an ominous line of shot-guns, and stood silently in a row, with hands outstretched above their heads, while an adept robber searched their persons for money, watches, and jewelry. Meanwhile the strong box of the express company was broken open, or if the treasure was placed in a safe at the bottom of the coach a powerful blast of powder tore open the safe and coach without delay. When all valuables had been abstracted the passengers were allowed to proceed without further molestation, as the robbers were never unnecessarily cruel, and no lives were in danger unless resistance was offered.[3] It may well be imagined that with these conditions and chances a ride over the Sierras never lacked for interest and excitement. If more rapid communication was desired it was afforded by the telegraph lines, which had been carried over the Sierras and across the continent. A line of 570 miles, built through a dreary desert in four months, stood as a record of

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[1] Carson Independent, August 26, 1863.

[2] Territorial Enterprise, May 11, 1864.

[3] *Vide* especially Territorial Enterprise, July 14, 1864; November 1, 4, 1866.

American energy on the 24th day of October, 1861, extending from Fort Churchill to Salt Lake, and meeting the wire carried over the Rocky Mountains from Omaha. From Fort Churchill wires stretched to Virginia City and San Francisco, so that the mining towns on the slope of an isolated range were yet in close connection with the civilization of two coasts. The value of such a line can scarcely be appreciated, but its maintenance against fire, floods, storms, snow, and hostile Indians has been an unending battle.[1]

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[1] Report of United States Commissioner of Mines and Mining, 1867, pp. 433-439.

CHAPTER X.

THE MINING CITY.

The establishment of easy and rapid communication with Californian cities by the construction of mountain highways contributed directly and largely to the development of the towns on the Comstock Lode. Virginia City discarded the charter obtained from the Utah Legislature in 1861, and was incorporated by act of the Nevada Territorial Legislature approved December 19, 1862, and modified by a subsequent act February 19, 1864.[1] A steady influx until 1865 swelled the number of citizens to more than four times the population at the close of 1860. The city was divided into wards, and the straggling cabins formed parts of connected rows. Lots of 40 or 50 feet frontage in preferred situations were sold in 1864 for $10,000, $12,000, and even $20,000.[2] Substantial wooden and brick buildings lined the main business streets and wooden platforms or sidewalks were laid in front of the stores and saloons. The unsightly, shapeless mining camp was rapidly transformed into a compact city with graded streets and well-marked blocks. Then its several quarters were separated from one another by plain lines of distinction. On the upper streets were the residences of the mine superintendents and leading merchants; through the centre of the city the two main business streets ran in a north and south direction, one passing over the ridge and forming the principal street of Gold Hill; at the foot of Mount Davidson was the Chinese quarter,[3] and below this crowded section were a few rickety huts which sheltered Piute or Washoe Indian families.

The feverish stir and restlessness of the early camps was somewhat abated, though the streets were still thronged with motley crowds—broadcloth elbowed by greasy flannel, diamonds and dirt in glaring contrast. Bow-legged Pi-ute bucks trudged along gravely in shoes down at heel, wrapped in dirty green or white blankets, and covering their mops of black hair with the ugliest of stiff-brimmed hats. Patient squaws and chubby children waddled in the wake of their lords, pouncing like flies on stray heaps of offal or rotten fruit from the market stalls, or clustering under sheds to doze or play poker, in which game the head of the family would often take a hand. Gambling and eating were occupations; work an unpleasant interlude, when the fathers would saw wood and the mothers pick up sticks, sustained by the smells from neighboring kitchens and the immediate prospect of broken victuals or whisky. To these vagabond lords of the soil the ant-like Chinese were a curious contrast—toiling sixteen hours in twenty-four over wash-tubs or cook-stoves, and grubbing for refuse stumps of wood in the neighboring ravines. Yet the busy, useful Chinese were snubbed and scorned by everybody, Indians not excepted, and only tolerated in the town because it was practically impossible to fill their places with white servants. So the inevitable Chinese quarter of a mining town grew up, with its neat storehouses, curious trinkets, grewsome smells of doubtful meats and packed dormitories, and the one pervading sickly odor of burning opium. Near by was another distinctive quarter, marked out by law for the residence of women of the town—two rows of white cabins with gaudily-furnished rooms, at whose uncurtained windows the inmates sat, spider-like, waiting for flies. Everywhere—among the business stores and the Chinese laundries; among the residences of wealthy citizens, high up on the mountain side, and the cottages of the harlots on the lowest street—were the drinking saloons; some with costly pictures, mirrors, and decanters, others with plain counters and black bottles, but all dispensing the staple Washoe beverage of whisky to their insatiable patrons. At all hours of the day, but in the evening particularly, the movement in and out of these saloons and along the principal streets was like the flow of a twisting stream over a rocky bed, apparently seeking an outlet at every point, but turning back with swollen waters toward its source again and again. Or, in some odd way, as one watched the flow it brought to mind the circling tramp of a tiger snuffing at bar after bar of his cage. Perhaps this was because the city, set in a desert, had something prison-like in its encircling wall of barren hills, and few thought of straying beyond its circle of lights.

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[1] Laws of the Territory of Nevada, 1862–'63, p. 84, Chap. LXXXIII; 1863–'64, p. 55, Chap. XLV.

[2] Territorial Enterprise, September 26, 1871; Editorial.

[3] Territorial Enterprise, July 23, 1863.

For the wants of the people were well supplied. Food, clothing, and general merchandise of all kinds were furnished in abundance by the sierran freight trains, and the charges were not exorbitant, as the following list of prices current attests:

PRICES CURRENT, VIRGINIA CITY, 1867.

Flour, per 100 lbs	$6.00	@	$6.50	Salt, 3-lb. sacks	$ 25	@	$ 00
Bacon, "California," per lb	25	@	27	Whisky, Monongahela, per gal.	5.00	@	6.00
Hams, " "	28	@	30	Whisky, Bourbon, per gal	4.00	@	6.00
Bacon, Eastern, per lb	20	@	25	Whisky, quart bottles	1.25	@	1.50
Hams, " "	20	@	25	Coal-oil, per gal	1.20	@	1.50
Butter, ranch, per lb	42½	@	50	Eggs, per doz	62½	@	00
Butter, Eastern, firkin, per lb.	40	@	50	Eggs, per box, 50 doz	50	@	00
Green coffee, Rio, per lb	35	@	00	Mackerel, per kit	5.00	@	00
Green coffee, Java "	40	@	00	Mackerel, per bbl	18.00	@	20.00
Coffee, Chartres', 1-lb. papers.	50	@	00	Trout, Lake Tahoe, per doz	20	@	25
Cheese, California, new, per lb.	25	@	37½	Codfish, per lb	20	@	25
Candles, per lb	30	@	37½	Salmon, salt, per lb	20	@	25
Corn meal, per lb	10	@	00	Salmon, smoked, per lb	20	@	25
Lard, California, per lb	25	@	30	Salmon, fresh, per lb	25	@	37½
Sugar, crushed, per lb	19	@	25	Herrings, fresh, per lb	25	@	00
Sugar, brown, per lb	16	@	20	Herrings, salt, per lb	25	@	00
Sugar, powdered, per lb	25	@	00	Potatoes, per lb	2½	@	3
Sirup, golden, per gal	1.50	@	2.00	Potatoes, sweet, per lb	12½	@	16
Tea, black, Comet, per lb	1.12	@	1.35	Cabbage, per lb	7	@	8
Tea, green, " "	1.25	@	1.50	Green peas, per lb	12½	@	00
Tea, Japanese, per lb	1.00	@	1.25	Asparagus, per lb	20	@	25
Tobacco, plug, per lb	85	@	1.50	Onions, per lb	6	@	10
Salt, 10-lb. sacks	75	@	00	Beets, per lb	4	@	5
Salt, 5-lb. "	50	@	00	Turnips, per lb	4	@	5

Most of the miners lived in cabins, cheaply constructed of wood and plainly but comfortably furnished, cooking their own food or paying from $8 to $12 per week for board at restaurants. The price was high, but the food was varied and excellent, and men could well afford to live expensively when the wages of the laborer ranged from $3[1] to $8[2] per day.[3]

As the city began to take form its people began more and more to look upon it as a permanent home and to desire that it should be placed, as far as might be, on a self-supporting basis. During the foundation of the colony all mining machinery and supplies, except wood, had been transported from California, but in 1863 the first foundry in the Territory of Nevada was built on the slope of Mount Davidson, and a hoisting engine and pump were constructed during the spring of 1864 for the Bullion Mining Company.[4] The erection of other foundries followed, and though the larger engines were still imported from San Francisco, the necessary repairs could generally be made by the iron works at the mines.

The folly of transporting salt across the Sierras to a Territory whose soil differed little from that of Sodom was early seen, and provision was soon made for the supply of this staple from Nevada marshes. A train of nine Bactrian camels bore loads across the desert from the forks of the Walker River in 1861,[5] and in 1863 two companies were organized to quarry a salt plain at Sand Springs on the Humboldt River. Sixty tons were furnished monthly by one of these companies after beginning work, in June, 1864, at a cost to the consumer of $80 per ton instead of $120, the price asked previously for salt imported from California.[6]

In the conduct of this business an interesting trial was made of the comparative efficiency of camels and mules as pack animals in the Nevada deserts. On level, well-beaten trails the camels traveled as rapidly as mules, and over plains of deep sand as fast as oxen on a good road.

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[1] Paid to mill-hands.

[2] Paid to engineers in the mine hoisting-works.

[3] Contrast these wages with those paid to laborers of the same class in England and Europe in 1866:

Miners' wages per week in metal mines.

Cornwall	18s.-20s. = $4.50-$5.00	Saxony	60 groschen = $1.64.
North of England	16s. 6d.-22s. = $4.12-$5.50	Nevada	$28.00.

(Report of R. W. Raymond, October 30, 1867, in Report of United States Mining Commissioner, 1867, p. 608.)

Yet the cost of supplies would not average 100 per cent. less in Cornwall (*vide* Table of Supplies and Cost in Iron-producing Districts of England, by London Correspondent of Chicago Tribune, writing from London, May 15, 1867), nor 200 per cent. less in Saxony ("Down in a Freiburg Mine," St. James Magazine, 1864); so that the actual remuneration for labor was from three to six times as great in Nevada as in those old districts.

[4] Gold Hill News, May 25, June 27, 1864.

[5] Territorial Enterprise, August 3 and October 27, 1861; Sacramento Union, August 6, 1861; San Francisco Evening Bulletin, November 1, 1861.

[6] Gold Hill News, April 14, 1865.

Their average load was slightly under 450 pounds, which was nearly double the weight of an ordinary mule pack.[1] The cost of their fodder was small, as they ate greedily all kinds of grass, thistles, tules, and willows, and were particularly fond of the acrid griswood. Yet their substitution for mules was not a pronounced success, for they disliked to travel on stony mountain paths, which formed part of the route, and could hardly be urged forward by blows and curses. Their feet were cut by the sharp pebbles and alkali dust inflamed the sores, the rudely fitting pack-saddles chafed their backs and painful blisters were frequently formed.[2] Drivers who would care for their mules with some pride and anxiety allowed the tired camels to shift for themselves, sneering at them as misshapen brutes imported by the whim of some theorist, and the poor creatures were even less liked by travelers generally, whose mules and horses stampeded in fright at first sight of the strange beasts.[3] Judged by its progress and results, the experiment of the camels may be regarded as an instance of the fertility of American enterprise in projects and expedients rather than as a well-considered and fairly conducted test.

Copper and soda were obtained, like salt, from the neighborhood of the silver mines.[4] The copper ore mined near the Walker River and at other points was principally used in the manufacture of blue-stone or sulphate of copper for the supply of the mills, by an enterprising firm in the town of Dayton.[5] There is no doubt that sulphur might have been readily provided as well from districts in northern Nevada, but for some reason this mineral was imported from Sicily and the native deposits were not touched. Borax, alum,[6] electro-silicon,[7] and black oxide of manganese[8] were discovered in the search for useful mineral deposits; but coal, the one mineral which was most persistently and anxiously sought for, could not be found in sufficient quantity to justify the expenditure of capital in its extraction.

Cheap fuel was a pressing want of the mining district, and the neighboring hills were so scantily covered with trees that it was soon necessary to bring wood from the Sierras, or to find a substitute in adjacent coal-mines. Under the stimulus of the demand parties of prospectors hunted as eagerly for coal as for silver, and reports of great discoveries were soon spread abroad. Thus the Great Western Coal Company was organized in November, 1860,[1] to develop a coal-field alleged to exist on the emigrant trail from Salt Lake, about 90 miles from Carson City; but even the sturdy faith of Judge Cradlebaugh, its president, could not produce any fuel fit for burning. So, two years later, it was announced that the Pioneer Coal Company would be ready to supply all applicants in a short time;[2] but the coal was not forthcoming, though three companies aided the Pioneer in extracting the extensive deposits.[3] "Coal water," as it was termed, was encountered everywhere, however, and generally put an end to the search.[4] Some coal of fair quality was actually taken from these beds,[5] but rarely more than was needed to supply fuel for the working engines, and the mines were abandoned at the close of the year 1864.[6] The district was constrained, therefore, to rely upon the stunted wood growth of the ravines and hill slopes for the necessary fuel, and the demand was so great that, even in 1864, several hundred laborers were constantly employed in cutting and hauling firewood.[7] During the summer months cedar was sold at from $13 to $15 per cord and pine at from $16 to $18.[8] The leading mining companies, taught by the costly experience of a severe winter, showed some foresight in providing a stock of fuel for winter use; but the easy-natured people of the mining towns were generally less provident. Thus, when the early frosts gave warning of the change of seasons, the price of wood advanced at once from $20 to $30 per cord.[1] During the winter these high rates were paid, and the poorer people shivered over the costly flame of a few lighted sticks.[2] When the snow began to disappear from the roads in spring and the demand for fuel was less urgent, the market price fell again gradually to the summer rates—$17.50 per cord April, 1864; $13 to $14 per cord September, 1864.[3] The neighboring ravines were soon stripped of their scanty tree growth, and wagons from Carson and Washoe valleys brought loads to market from the borders of an expanding circle. Chinese gleaners followed the American wood-cutters, pulling up the brush, stumps, and roots from the denuded hills.[4] Trains of loaded carts could be seen daily coming from the Palmyra district and El Dorado Cañon, the chief sources of the supply,[5] and troops of little donkeys, with burdens of sticks piled high above their ears, scrambled down the steep hill slopes, goaded on by Chinese drivers, to their homes in the city. One hundred and twenty Chinese were so employed in 1866, and the daily sales of one firm of Chinese wood-merchants often exceeded $300.[6] A cord of wood doled out by their measurement cost from $33 to $48, a sale which yielded a profit of $20. In a season of exceptional severity, as in the winter of 1866–'67, when snow covered the roads to the depth of 6 feet, wood was sold for $40 and even $50 per cord,[7] and the sufferings of the poor were extreme. The hardy Chinese burrowed under the snow for the roots, which they hawked about the streets at the rate of $60 per cord, selling their loads as soon as gathered. This rate was of course exceptional, but even in the most favorable seasons the supply could scarcely keep pace with the increasing demand. Timber was in no less urgent request, and the cost of transportation was even greater, as it was cut mainly on the slopes of the Sierra Nevada range. In 1866 it was reported that 200,000 cords of wood were delivered to consumers in the district.

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[1] San Francisco Evening Bulletin, November 1, 1861; Territorial Enterprise, February 28, 1863.

[2] Territorial Enterprise, September 30, 1864.

[3] *Ibid.*, May 15, 1869.

[4] *Ibid.*, July 2, 1870.

[5] *Ibid.*, April 29, 1873.

[6] *Ibid.*, February 28, 1863.

[7] *Ibid.*, August 1, 1877.

[8] Gold Hill News, April 11, 14, 19, 1864.

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[1] Territorial Enterprise, November 17, 1860; San Francisco Evening Bulletin, November 21, 1860.

[2] Territorial Enterprise, February 9, 1862; San Francisco Evening Bulletin, February 19, 1862.

[3] Virginia City Territorial Enterprise, May 24, 1862.

[4] San Francisco Evening Bulletin, May 30, 1862; Territorial Enterprise, July 10, 1864.

[5] Territorial Enterprise, March 31, May 24, 1862; San Francisco Evening Bulletin, March 19, 1862.

[6] R. M. Daggett, Superintendent Virginia Coal Mining Company, reported August 5, 1876, that 9,800 tons had been taken from their mine in El Dorado Cañon prior to 1865, and 21,700 tons by the re-incorporated company from 1872–'76. Of this total amount 13,800 tons had been burned in Storey County and the balance in the hoisting-works of the mine.—(Territorial Enterprise, August 13, 1876.) This company, however, never paid a dividend, although producing one hundred times as much as all the other companies combined, if this report is accurate.

[7] Virginia City Union—in Mining and Scientific Press, November 19, 1864.

[8] Gold Hill News, October 20, 1863; March 20, 1865; September 11, 1867.

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[1] Gold Hill News, November 14, 1863; December 9, 28, 1865; January 9, 1868; March 13, 1868.

[2] *Ibid.*, March 2, 1867.

[3] *Ibid.*, April 8, September 19, 1864.

[4] The Big Bonanza, p. 384.

[5] Virginia City Union, in Mining and Scientific Press, November 19, 1864.

[6] Gold Hill News, April 5, 1866.

[7] *Ibid.*, March 1, 2, 1867.

Daily consumption of firewood.

	Cords.
By hoisting-works on mines	70
By mills crushing ores	378
For domestic use	120
	568

568 cords per day, × 365 days, = 207,320 cords, yearly consumption. Cost, at $10 per cord, = $2,073,200. It was estimated that the consumption of lumber for building purposes and mining timbers was 25,000,000 feet (board measure) yearly, of which 17,900,000 feet were used in and around the mines. The annual cost of this supply was computed to be $800,000.[1]

Within the city limits similar indications could be noted of a growing reliance upon the stability of the main industry of the district which warranted the investment of capital in dependent enterprises. Thus the franchise of an embryo gas company was purchased by several capitalists in 1862, and expensive works and mains were shipped from Philadelphia on a vessel, which the cruiser Florida captured and destroyed in April, 1863. In no way discouraged, the same purchasers were incorporated as the Virginia Gas Company in June, 1863, and procured, at a high price, the necessary material in California. The works were fully completed in November of the same year, and the principal streets of the city were lighted.[2] Few cut-stone houses were built, though a rock quarry had been opened by Osmer Dost as early as the summer of 1860,[3] but a considerable number of brick stores and dwellings were erected. From clay obtained near the city bricks of good quality were manufactured, and the Virginia City Pottery Company were successful even in the production of fire-proof brick, which commanded a ready sale at $500 per M.[4] By these and other business ventures of less note the growth of an independent and self-reliant feeling was fostered, and in spite of the fierce litigation and other discordant influences it was felt more strongly as the years passed that the tie of common interests and sectional pride was an all-embracing bond, and men welcomed any agencies which confirmed this union.

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[1] (Report of J. Ross Browne, United States Commissioner, 1867, p. 382.)—As the mills were in active operation less than two-thirds of the year upon an average, and the domestic consumption was overestimated, the amount of fuel used was probably only three-fifths of the total stated, or 120,000 cords, in round numbers.

[2] Territorial Enterprise, September 22, 1863.

[3] Sacramento Union, August 16, 1860.

[4] Territorial Enterprise, September 30, 1863.

As the miners of the lode stood among the foremost of their class in point of general intelligence, it was natural that they should appreciate the advantages of a thorough common school education. Even those who could not read, if any such were of their number, earnestly desired that their children should not grow up in ignorance like themselves. Therefore an excellent system of common schools had been provided under the Territorial organization, and the first annual report of the State superintendent for the year ending August 31, 1865, shows that eleven serviceable schools had then been established in Storey County, comprising Virginia City and Gold Hill. The amount paid out for school purposes in this county during the year was $28,657.59, of which sum $17,130.55 was paid in salaries to teachers.

	Salary of teacher.
Virginia City:	
Third Ward Grammar	$1,800
Third Ward Intermediate	1,350
Third Ward Primary	1,000
Third Ward Object Teaching	1,000
Fourth Ward Primary	1,200
First Ward First Primary	1,300
First Ward Second Primary	1,000
Gold Hill:	
Ungraded Grammar	1,350
Second Primary	1,000
For instruction in music	900
American Flat:	
Primary School	1,000
Flowery District:	
Primary School	1,000[1]

The number of children attending school had increased from 420 in 1863[2] to 810 in 1866. Of the 850 children in the county between the ages of 6 and 18 years, 718 or 84.5 per cent. were enrolled on the school lists, and the average daily attendance was 84.8, an excellent comparative record. The whole number of children (under 21 years of age) in the county was 1,714, nearly one-fifth of whom (333) had been born in Nevada.[1]

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[1] Report of State Superintendent for the year ending August 31, 1865.

[2] Gold Hill News, October 27, 1863.

The need of school training was realized more generally than the value of religious observances, yet several church organizations had been formed, and contributions for their support were liberal, though the average attendance and membership were small. The tents and rude cabins of the early church societies had been replaced by substantial frame buildings built upon stone foundations and suitably furnished.[2] The Catholic church building cost only one-half the sum expended upon one of the more pretentious Protestant church edifices, but its membership was twice as numerous as that of the combined Protestant churches, and its relative influence among the miners exceeded this proportion. Though its organization was incomplete, compared with that of later years, yet it was a recognized power in the lode, and, when the vengeful miners were scouring the city in search of a wages-cutting superintendent, the cabin of its priest sheltered the fugitive as well as the ward of the cardinal was guarded by its viewless circle.

By the civic organization, the foundation of churches, and the establishment of schools the union of the people was more closely cemented; but perhaps no influence was more potent than the war of the rebellion (1860–'65). The seat of war was so distant and the colony so young and dependent that it sent no organized and representative troop into battle; but the hearts of its citizens were always open to appeals for aid in sustaining the forces of the nation through the long contest, and there was a fervor and heartiness in these contributions which deserves record as an enduring honor to the workers on the Comstock Lode. Even the Piute Indians caught the generous infection, and several brought in their mites to swell the collection for the Sanitary Fund in 1862.[3] A characteristic humor was often shown in these contributions. Thus a most liberal donation was once obtained for the Sanitary Fund, in 1864, by the odd device of selling a flour-sack at auction. This sack had been sold in the city of Austin, Nevada, for $5,300,[1] and was then borne in a triumphal procession through the streets of Silver City, Gold Hill, and Virginia City, escorted by a jubilant brass band, national guards, orators of the day, horsemen, carriages, and a multitude on foot.[2] At the little town of Silver City $1,800 was bid, Gold Hill offered $6,587.50,[3] and when the sack reached Virginia City the increasing crowd were wild with excitement. The voice of the auctioneer was drowned in the frantic chorus of bids. The employés of the Chollar Company offered $500; the miners of their old rival, the Potosi Company, gave $50 more, and both were silenced by the bid of the men in the service of the Gould & Curry Company, who "raised Austin out of her boots" by the call of $3,500.[4] Not only money but county scrip, mining shares, and even a shot-gun ,and pouches were brandished in the face of the exhausted Fund agent, who could not receive the contributions quickly enough to satisfy the impatient generosity of the crowd. The total receipts in money from the sale in Virginia City were $13,515,[5] and the sack was then sent across the Sierras to California, having gained nearly $22,000 for the Sanitary Fund from the Comstock Lode district alone. This madcap humor went so far, moreover, that a small brown bug crawling on a man's leg was seized and sold for $10 in aid of the Fund, and a spectator who ventured to speak disrespectfully of the bug and the Sanitary Commission was soundly thrashed by an angry champion.[6]

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[1] Official Report of County Board of Education, 1866.

[2] The Catholic church was built in 1862, at a cost of $12,000; the Protestant Episcopal church in the winter of 1862–'63, at an expense of $30,000; the Methodist Episcopal church in 1863, costing $30,000; and the Presbyterian church in 1864–'65, for $20,000.—(Statistics furnished O. D. Wheeler, United States Census Agent, by church officers.)

[3] Territorial Enterprise, October 28, 1862.

Similar ebullitions of feeling were not uncommon. The miners of the Comstock had a simple temperament, responding frankly to any direct and stirring appeal, and changing its mood with every new impulse. Men of mature years were swayed by their passions like children and seemed to know no medium between stolidity and passion. The ordinary miner's life is singularly barren of color and variety, and the slumbering emotions are rarely awakened, but their force seems to be concentrated in these moments of activity. When the news of the surrender of General Lee and the Confederate Army was announced, the scene on the lode baffles description. The people of Virginia City were literally frantic with excitement,[1] and the air was filled with the mingling sounds of bells, gun-discharges, beaten anvils, music, and cheers. All the saloons were crowded, and men drank over the bars and in the streets, pledging now one popular hero and then another, saluting the old flag, Old Abe, old everybody, until they lost all power of recollection and drank speechlessly. "No such drinking," wrote the editor of the Virginia Union, "was ever before seen anywhere. In less than three hours the majority of the men in the city were crazy drunk, including many who were never under the influence of liquor before, and scores were to be seen lying in heaps almost anywhere. Business was entirely suspended, and the printers, editors, reporters, and proprietors being all drunk no papers were issued."[2] This carnival of whisky was immediately succeeded by a day of gloomy sorrow and bitterness when the news of the assassination of the President of the United States came over the wires to the towns of the lode. No treasonable whisper was heard that day, for the warm-hearted men who had pledged Old Abe in overflowing cups on the 11th of April would have shot dead any wretch who ventured to condone the crime of the assassin.

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[1] Gold Hill News, May 16, 1864.

[2] Territorial Enterprise, May 17, 1864.

[3] Territorial Enterprise, May 18, 1864.

[4] *Ibid.*, May 17, 1864.

[5] *Ibid.* May 18, 1864.

[6] *Ibid.*, May 17, 20, 1864.

To judge such men by reference to the ordinary canons of taste, demeanor, and action is uncharitable, if not unfair. The nature of the miner and the conditions of his life have been rarely presented in a clear uncolored light. The most vivid impressions of the Western mining camps are derived by most readers probably from the graphic pen of Bret Harte, but the odd characters and temper which he has so admirably portrayed are often the embellishments of a fancy which was not hampered by the plain realities of mining life. The Comstock miners were and are ordinary laborers, raised above the common lot of their class by the perils, chances, and rewards which are incident to their service. These conditions have molded their characters and their lives. Their senses have been made more acute and their intellectual faculties called into more frequent exercise, but at the same time their passions have been awakened and stimulated, and the promptings of conscience have been insensibly dulled by the ever-present temptations of their life. A lust for rapid and extraordinary gains has possessed all who risk fortune and life in the mines. This passion obliterates all nice distinctions of right and wrong, and often tramples upon the clearest dictates of honor. Moreover, the daily perils of a miner's work and its certain injury to health tend almost irresistibly to make the men reckless and inclined to couple a short life and a merry one together. Merriment in a mining town amid barren mountains means to uneducated men drinking and gaming—staple amusements which are inevitably dangerous to all whose passions are not under the control of a strong will and cool judgment. It is in no way surprising, therefore, that excesses of all kinds were committed in the Washoe mining towns.

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[1] Territorial Enterprise, April 12, 1865.

[2] Virginia Union, April 12, 1865.

The police report for June, 1863,[1] shows a total of 167 arrests in Virginia City on the following counts:

Grand larceny	6
Forgery	1
Robbery	1
Drawing deadly weapons	10
Assault and battery	3
Petit larceny	7
Assault	1
Fighting	13
Threats against life	1
Resisting officer	4
Malicious mischief	2
Disturbing the peace	36
Vagrancy	1
Violating city ordinance	1
Sleeping on the sidewalk	11
Selling goods without license	1
Held to bail to keep peace	1
Delirium tremens	1
Drunk and disorderly	66
	167

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[1] Territorial Enterprise, July 2, 1863.

This list does not include arrests made upon warrant, when the prisoners were taken directly to the justice's court, an addition which would swell the total number to more than 200. The population of the city proper at the time did not exceed 7,000 probably, so that the monthly percentage of arrests compared with the number of citizens was .0285+, or 34 per cent. annually if the same rate was maintained. It should be borne in mind, however, that the city was a haven for ruffians who were arrested repeatedly on various charges, and that the body of miners committed less than half of the offenses charged on the record. In passing judgment upon this class of offenders the temptations which beset them should be well considered—the dreary and perilous nature of their daily work, the natural craving for some absorbing amusement when they passed from their dungeons into the light of day, the dearth of all amusements which attract men of their temper and crude modes of thought, and the strong enticements of the brightly lighted saloons, the hurdy-gurdy houses, and gaming rooms.

How wearisome and painful the life of a miner is at best, only those who have earned their bread in underground prisons can know. From the most ancient times, writes Gamboa, the toils of the mine have served as a punishment for slaves, a torment for martyrs, and a means of revenge to tyrants.[1] According to the grave description of Plautus, mining is attended with every pain which hell can inflict, and, indeed, that poet considers the torments of hell less insufferable.[2] The crown laws of Spain appointed the raising of ore as an appropriate punishment for vagabonds, being an occupation of incessant labor and continually exposed to imminent risks, in view of which it is said that the Belgians named a mine shaft *la fosse* (the grave) intentionally, and in Cornwall the old open workings on a lode were called coffins, if Simonin's record is to be trusted.[3] The introduction of labor-saving machinery and the progress of mining science have mitigated the toils of mining in some measure, but it is still the most dreary and dangerous employment in which workingmen are engaged, and on the Comstock Lode, in particular, certain peculiar conditions have made the work exceptionally distressing to the laborer. These conditions, which are more fully considered in other connections, are chiefly the rapidity with which the mines have been opened, the neglect of thorough or systematic ventilation, and the extraordinary increase of temperature with progress beneath the earth's surface.

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[1] Gamboa's Commentaries, Heathfield's Translation, vol. II, p. 280.

[2] *Ibid.*, p. 279.

La Vie Souterraine; translated by H. W. Bristow, F. R. S., p. 204.

The tendency of such a life and the consequent revolt of overstrained natures is clearly brutalizing. Duels at the hurdy-gurdy houses and bar-room wrangles were the natural consequences. Prize-fights attracted crowds of excited partizans, who sometimes varied the spectacle of two bleeding and gasping fools in a ring by engaging in a general melee, as on the occasion of the notable encounter of two pugilists in September, 1863, when, after 14 rounds had been fought, the referee ruled that a foul blow had been struck, a decision which instantly excited a furious dispute, culminating in a fusilade of pistol-shots, a wild stampede of terrified horses, and a hand-to-hand fight of the maddened crowd.[1]

These gladiatorial shows were varied in later years by contests of animals in Maguire's Opera House, the Virginia City amphitheatre. Here, in 1865, a young cinnamon bear fought with four bull-dogs in succession, until the audience, more pitiful than the vestal virgins, called upon the Washoe editor "to stop the fun,"[2] and six years later another opera house was filled with spectators, who came to see a bull and bear fight for the mastery in a contracted arena; but as the bull could not prod the bear into a fighting humor the audience left the theatre in disgust.[3] They were better gratified in the following month, when wild-cats fought with bull-dogs and only succumbed after a desperate struggle for life.[4]

These were almost the only pleasures which the dreary mountain range afforded, and it is creditable to the sense and humanity of the Washoe miners that such exhibitions were comparatively rare. But it was to be expected that the ordinary vices of mining life would flourish in Washoe. There was deep drinking and high gambling. The single men were usually licentious, and much of the Comstock silver and gold was squandered in houses of ill-fame; yet it should be noted that the men were not unbridled in their passion, for virtuous women were uniformly respected, and no lady need desire a more trusty guardian at night-fall than a rough miner following in her steps on his way home from work. It is only just to add, also, that these workmen have always been above the level of their class in intelligence, and a taste for reading has saved many from indulgence in demoralizing pleasures.

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[1] Territorial Enterprise, September 23, 1863; Sacramento Union, September 25, 1863.

[2] Territorial Enterprise, October 8, 1865.

[3] Territorial Enterprise, August 6, 1871.

[4] Gold Hill News, September 23, 1871.

In all mining districts of the Pacific coast the people show a keen interest in the news of the day, and are impatient to learn it at the earliest possible moment. Hence a daily newspaper is often issued before a house is reared to cover the printing-press; but this passion for news has never been more general and intense than in the Comstock district. The office of the oldest newspaper in Nevada, the Territorial Enterprise,[1] was transferred from Carson to Virginia City in November, 1860,[2] and the paper soon proved more profitable than an ordinary mine. Though the advertising rates were exorbitant its columns were crowded, and many notices were rejected daily for lack of room, or issued in irregular supplements. In 1863 it was printed by steam-power, and had a working staff of five editors and twenty-three compositors.[3] The Virginia City Union and other daily papers competed with the Enterprise for popular patronage, and three, at least, were well supported in 1863,[4] besides the Gold Hill News, established in the fall of that year at Gold Hill. Of the total circulation no exact record is attainable, and the sales varied largely from week to week; but the following list, showing the number of newspapers delivered daily by carriers in Virginia City alone, in 1865, will give some idea of the extent of the demand:[5]

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[1] First number issued at Genoa, Carson County, December 18, 1858.

[2] The Big Bonanza, p. 217.

[3] Samuel L. Clemens (Mark Twain), City Editor Territorial Enterprise, 1863; "Roughing It," p. 313.

[4] Nevada Directory, 1863.

[5] Territorial Enterprise, September 26, 1865.

Circulation of Newspapers, Virginia City, 1865.

Territorial Enterprise	745
Virginia City Union	190
Gold Hill News (estimated)	150
Sacramento Union	117
San Francisco Evening Bulletin	90
San Francisco Call	15
San Francisco Alta	3
San Francisco Flag	2

Besides these Pacific coast papers a considerable number of newspapers from the Eastern States were regularly received, there being very few American miners who did not subscribe for one or more, and periodical literature had many readers also among the miners. In 1867, 325 copies of Harpers' Monthly and 112 copies of the Atlantic Monthly for the year were sold in Virginia City and Gold Hill, and during the summer months alone 1,200 numbers of English magazines were bought in these towns, the budget of the periodical dealers costing about $1,300 monthly.[1] Popular novelists and standard authors were also generally read, as is shown by the fact that 194 separate volumes of Dickens' works, 23 sets of Froude's History of England, and 44 copies of Shakespeare's works, the majority being the most expensive editions, were sold in Virginia City during the same summer.[2] The works of the principal American poets were in constant demand, 50 copies of Whittier's Snow-Bound being sold in one week after the volumes were offered to customers. These large purchases were made, it should be remembered, by men who had the privilege of obtaining books and papers from two public libraries, in Gold Hill and Virginia City, both of which had reading-rooms attached.[3]

The refining influences of the stage were also clearly marked, for well-enacted plays of the better class have been as well received on the Comstock Lode as in communities whose pretensions to culture are greater, and an increased sale of standard dramatic literature has been one of the more easily recognized effects of these representations. During the brief engagement of John McCullough at the Virginia City theatre, in the summer of 1867, to cite one recorded instance, 30 full copies of costly editions of Shakespeare's works were purchased.[1] If performances with slight traces of sense, humor, ingenuity, or decency have also been popular, few cities at present could cast the first stone at the Washoe mining towns.

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[1] Gold Hill News, September 21, 1867. [2] *Ibid.*, September 27, 1867. [3] *Ibid.*, September 21, 1867.

To cultivate a perception of the beautiful in nature and the fine arts among those whose homes are in the barren mountains of Nevada is unfortunately a Utopian dream. Only a few flowers will bloom on that sterile soil, and the stunted firs which cling to the rocks are misshapen abortions of their species. The white-capped sierran range and the green-edged stream of the Carson are the only oases of the landscape. Museums and picture-galleries will hardly be established in mining-towns of uncertain stability or among a people whose appreciation of such collections is undeveloped; yet an instinctive craving for something fairer than their customary surroundings was evident in the little plots of garden ground, where a few plants struggled persistently for life, and in the occasional entrance of a wagon loaded with flower-pots and shrubs in bloom.[2] If the finer tastes of the miners were undeveloped the progress in the development of the mines was not thereby retarded; yet the work of exploration was not at first carried on with skill or efficiency.

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[1] Gold Hill News, September 21, 1867.

[2] The plants in chief demand were roses, geraniums, verbenas, fuschias, orange trees, and oleanders. Prices ranged from $3 to $10 per pot in 1863.—(Territorial Enterprise, April 30, 1863, April 22, 1870.

CHAPTER XI.

SIX YEARS OF PROGRESS.

Mr. Deidesheimer's device of square set timbering, particularly adapted, as is evident, to the extraction of the ore-bodies of the Comstock Lode, would have obviated the chief practical difficulty encountered in the early development of the mines had it been uniformly and skillfully applied; but this was not always the case, for while some superintendents used all possible care in supporting the walls and roof of their ore-chambers and prospecting-drifts with substantial timbers, others were inexcusably negligent in this regard. Adolf Sutro had noted the inefficient and clumsy way in which a number of the mines on the lode were opened in a letter to the San Francisco Alta: "The working of the mines," he wrote, "is done without any system as yet. Most of the companies commence without an eye to future success. Instead of running a tunnel low down on the hill and then sinking a shaft to meet it, which at once insures drainage and ventilation and facilitates the work by going upward, the claims are mostly entered from above and large openings made, which require considerable timbering and expose the miners to all sorts of difficulties."[1] The water which poured into the bottom of these pits and inclines before they had reached a depth of 100 feet below the surface stopped work in this direction for a time, as has been related, until pumping-engines could be transported across the Sierras and placed on the line of the lode. Meanwhile numerous adits were projected and cut for the purposes of drainage and prospecting far into the side of Mount Davidson and the adjacent hills. The mines were thus kept comparatively free from water; but before many months had passed the careless manner in which ore-bodies were removed from the ledge at different points was made strikingly apparent.

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[1] San Francisco Alta-California, April 20, 1860.

In the spring of 1862 the snow on the slopes of Mount Davidson began to melt rapidly. The ground which covered the shallow mine-workings at Gold Hill was washed away by the descending floods and softened by percolating streams. When the earth ceased to be self-supporting the few timbers which propped the roof and walls of the excavations gave way, and many mines were effectually closed.[1] Even in midsummer a number of these mines had not been reopened, though some were partially cleared of débris. The industry of the district received a serious check, but this grave warning was not sufficient. On the morning of July 15, 1863, a startling crash was heard at the other end of the lode, when half of the Mexican Mine, from the surface to the depth of 225 feet, caved in with an irresistible momentum which bore the ponderous mass of crumbling rock and splintered wood past the limits of the mine into the workings of the Ophir Company.[2] Fifty feet of the fourth gallery or level in the Ophir Mine was at once obliterated, and large portions of the second and third galleries soon gave way before the accumulating pressure. An acre of surface was crushed open as if a blast had exploded beneath;[3] the unsupported roof sunk down; the main shaft on the south line of the Mexican Mine closed up, and part of the engine-house was undermined and destroyed. "The whole mine," wrote an admiring eye-witness, was "a lovely chaos."[4] Caves like this do not occur without a previous warning. A gradual settling of the ground had been going on for a number of days; props were thrown out of place and cap-timbers broken; the sharp cracking of overstrained pillars and dull rumbling noises of shifting ground could be plainly heard; still the superintendent remained blind and deaf; weak supports were not braced and sinking roofs were not upheld. At length his underground house came down upon his head and nearly crushed him in its fall. Twenty workmen were in the mine when the roofs of the galleries began to close upon them; headed by the superintendent they rushed toward the incline leading up out of the mine. A mass of crumbling rock fell near them, forcing the air through the drift in a sudden blast, which blew out their candles; the sound of splintering timbers and cracking rock filled their ears. In single file they groped their way up the narrow stairs, crouching and crawling in the darkness through the closing passage which led to the light. After a short but frightful climb they reached the surface and knew what it was to breathe freely, having escaped from an earth-monster's grip far more tenacious than the clutch of the devil-fish. The superintendent scarcely deserved his good fortune. His mine was a wreck and twenty stout men nearly lost their lives through his negligence or incapacity. Under the old Roman Empire, when life and property were guarded as valuable, he would not have escaped judgment, as by the laws of Theodosius and Valentinian those who culpably occasioned loss of life and property by the falling in of a pit or mine were condemned to death, because they had set themselves up as professors of an art they did not understand.[1] In this buoyant, careless-tempered mining district, however, such professors were only laughed at.

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[1] San Francisco Evening Bulletin, July 17, 1862.

[2] Territorial Enterprise, July 16, 17, 1863.

[3] Mining and Scientific Press, July 27, 1863.

[4] Territorial Enterprise, July 17, 1863

Twenty months later another great cave rent the surface of Gold Hill (March 5, 1865), filling the upper levels of the Imperial, Empire, and Eclipse mines, and breaking up the ground between the Empire and Eclipse hoisting-works so violently that the engines were thrown out of place.[2] The first level of the Imperial Mine was entirely closed, the supporting timbers being crushed like egg-shells, and so great was the concussion of the atmosphere when the vast body of earth settled, as it did with one mighty crash, that fragments of rock were thrown more than 300 feet up the Imperial shaft, against the roof of the hoisting-works, with such force that they were instantly powdered and filled the room with a cloud of dust. The shafts of the Eclipse and Empire mines were so warped that the men on the lower levels could not be hoisted out, but made their way to the shaft of the Imperial Company and were then raised to the surface. This was a startling experience, but as the ground had, fortunately, refrained from falling in until the upper levels were exhausted of their ore-contents and no person was killed by its fall, the superintendents agreed in looking upon the cave as a permanent benefit. This cheerful view of the situation was characteristic of the time and place. "Nobody's hurt and who cares," might have been adopted as a fitting motto by these happy-go-lucky miners.

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[1] Gamboa's Commentaries, Heathfield's Translation, vol. 1, p. 336.

[2] Gold Hill News, March 6, 1865.

Yet the most reckless of them could not always regard these accidents with indifference. When men were crushed and buried under masses of rock and splintered timbers no one could smile. Instant death was here a mercy to the victims. The mangled bodies of men who died like Opie[1] and Sullivan[2] were less piteous to see than the prolonged torture of one like Patrick Price, who was buried alive by a cave in the Chollar-Potosi Mine, October 5, 1867. He was at work near the bottom of an incline when the ground about him suddenly gave way, owing to the insufficient timbering of a lower level, and he was caught and carried down several feet by falling timbers and rock. The mass above pressed heavily upon him, and he could not move hand or foot, but his head was in some way protected and he was able to call with a strong voice for help. His fellow-miners answered the call, but the walls of the incline were cracking and settling so fast that none dared to venture within twenty feet of the buried man. For more than an hour they watched the ground slowly closing above his head, but forced themselves to speak cheeringly that he might not suffer the anguish of despair also. Once they set fire to a ball of oakum saturated with coal-oil and rolled it down toward him. "I see the light," he cried, joyfully. "I am glad you're coming for me, boys!" At this cry a desperate attempt was made to place a rope about his body but in vain. The loose earth was falling about his face, and his voice could scarcely be heard. He had borne his lingering torture bravely, but at length one moaning cry passed his lips. It was his last. In a few moments a great mass of clay, rocks, and timbers slid down upon him and his suffering was ended.[3] It would seem that the recovery of a body, merely to lay it in a shallower grave was an uncalled-for service to the dead, but miners are very reluctant to leave a corpse in a mine where they are working. Several attempts were, therefore, made at different times to find the body of Price, but without success, until the 27th of May, 1869, when the disfigured remains of the poor miner, half eaten by rats, were uncovered.[1] A simple head-board stands in the Catholic grave-yard to record his death and to declare without words the criminal carelessness or ignorance of the men who failed to timber and support a mine-level properly.

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[1] Virginia City Territorial Enterprise, July 10, 1866.

[2] *Ibid.*, October 16, 1866.

[3] Sacramento Union, October 8, 1867; Gold Hill News, October 7, 1867.

Accidents may of course occur from rock falls while men are at work for which mine owners are not justly blamable. In spite of repeated warnings miners are often careless and lose their lives in consequence of their rashness; or, again, when every precaution apparently is taken, some unforeseen chance may prove the best judgment to be in error, and the usual coroner's verdict, "No one to blame," may then be just. In later years, warned by experience, superintendents have used all due care to protect their workmen, and probably no mines in the world are now more securely timbered than those on the Comstock Lode; but the fatal results of the early neglect should be remembered forever by American miners. Opie, Sullivan, Price, Brightmore,[2] White,[2] Dougherty,[3] Kennedy,[3] Hanson,[3] and others form a ghastly company who, though dead, bear witness as no living men can to the necessity of experience, skill, and care in the development of our mines. The men who refused to split Hanson's head open with an ax to end his misery will not forget the cause of his death;[4] but it is to be feared that some who have not seen strong men crushed into bleeding pulp before their eyes may be heedless of all other warnings.[5]

While these caves were rending the face of the ground and burying men in the mine-depths work along the line of the lode was rapidly pushed. American miners may sometimes be reckless, but they have never been accused of being dilatory. As the shafts grew deeper the simple windlass, by which a bucketful of water, rock, or ore was raised to the surface, was replaced by whims turned by horse-power and by small steam-hoisting engines. In 1860 the Ophir Company had first raised ore with steam-power by means of a rope wound round the shaft of their pumping-engine,[1] thus pulling a car filled with rock up the incline which they had sunk on the dip of their ledge; yet, in the spring of 1864, they were working with a large new whim operated by horse-power. One horse turned the whim easily, hoisting a bucket 50 feet with every revolution of the drum.[2] The Sunrise Company in the spring of 1864, were building a whim in place of their former windlass on the score of greater cheapness and rapidity of working.[3] The cost of operating a windlass by two men during three shifts of eight hours each was stated to be $24, while two drivers and two horses would hoist out the same quantity of rock by means of a whim at a total daily expense of $12.

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[1] Gold Hill News, May 31, 1869.

[2] *Ibid.*, January 3, 4, 1870.

[3] *Ibid.*, June 29, 31, 1870; San Francisco Bulletin, June 29, 30, 1870.

[4] *Ibid.*, June 29, 31, 1870.

[5] The fatal accident at the Golden Terra Mine, near Central City, Dakota, in May, 1880, emphasizes this conclusion; for several of a working shift were killed and the remainder were only rescued by extraordinary exertions after an imprisonment of nineteen hours.—(Associated Press dispatches, May 20, 1880.)

During the first two years of work on the lode only a few companies had the mouths of their shafts covered by buildings, but at the close of 1862 not less than forty companies had erected houses of some sort over their shafts, and twelve, at least, had machinery driven by steam for pumping water or hoisting rock from their mines.[4] Viewed from the mountain summit above the line of the shafts the dingy heaps of rock and sand near the mouth of every pit and tunnel appeared like ant-hills rising imperceptibly from day to day. Some hills were comparatively deserted, but all day long a moving swarm of men, oxen, horses, and mules clustered about the dumps of the chief ore-producing mines, the Ophir, Mexican, California, Gould & Curry, Chollar, Potosi, and the small Gold Hill claims.[5] Here the ore of different grades was assorted, screened, and shoveled into sacks or thrown into carts. Moving trains wound in and out through the surrounding streets, sometimes caught fast for a moment in a confused jam, and then escaping from its meshes with a parting salute of curses and whip-crackings.[6] Below the surface the little army of miners was steadily burrowing its way through the heart of the ledge, cutting a few feet daily with picks and drills, one shift succeeded by another, descending and ascending the shafts in swaying buckets dangling at the end of elastic ropes; or, as in the Ophir Mine, mounting the incline by a steep narrow flight of steps 400 feet in length, bearing flickering candles in a rational torchlight procession.[1]

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[1] San Francisco Evening Bulletin, December 13, 1860.

[2] Gold Hill News, April 21, 1864.

[3] Gold Hill News, April 22, 1864.

[4] Virginia City Union, December 20, 1862.

[5] Sacramento Union, December 12, 1862.

[6] Virginia City Territorial Enterprise, August 26, 1862.

North of the Ophir Mine, beyond the dwelling-houses of the city, on the south side of Cedar Hill, as the peak next to Mount Davidson was called, three companies were at work, in the spring of 1862, washing away the hill-side soil of red loam and broken quartz with hydraulic streams. The Cedar Hill Float Rock and Surface Mining Company, the first to begin work, had a stream of only 50 feet head, but the Cedar Hill Float Rock and Mining Company No. 2 and the Virginia City Hydraulic Mining Company had constructed a large reservoir fully 600 feet above their placers, which was filled by means of a ditch cut from Spanish Ravine, and the water from it conveyed through a flume to the desired point for use. The supply was not large, but the fall was so great that the stream cut its way rapidly into the bank, "thrashing boulders about like pebbles."[2]

This hydraulic or surface mining was merely an incidental accompaniment of the great task of exploring the depths of the lode. As the unruly, boisterous mining camp began to yield to the control of civilizing and restraining influences, so from the discordant and unsystematic operations underground a consistent and uniform scheme of lode-development was gradually evolving. Shafts and drifts were cut with some reference to the lines followed in adjacent mines; connections were established systematically between adjoining galleries on the same level, and currents of fresh air were made to flow from shaft to shaft, changing and purifying constantly the vitiated atmosphere of the working levels. The old line of works was generally abandoned, and operations were carried on through a new line of substantially constructed vertical shafts several hundred yards to the east of the lode croppings and consequently nearer the base of Mount Davidson. These shafts were divided into three or four compartments, the Curtis Shaft of the Savage Mining Company being an example of the better class. This contained a pump compartment 5 by 6 feet, two "hoisting" compartments for the ordinary mine work, and one "sinking" compartment, by which the shaft was excavated, equal in size to the pump compartment.[1] The first row of shafts had been lined with planks only three inches in thickness, but the rock sides of the new shafts were held in place by successive sets of timbers 12 inches square, supported by posts 4 feet in length.[2] At different points on the line of a shaft, generally 100 feet apart, openings were made into chambers with a floor surface of 100 square feet or more, called stations, where various mine supplies were stored, and from these stations galleries, known technically as cross-cuts, were extended toward the west at different levels through the barren country rock until they reached the hanging wall of the lode, or some sheet of clay, which was usually considered its eastern boundary plane. When this clay wall was fairly pierced, the cut was prolonged, at the discretion of the mine superintendent, either partly or entirely across the lode, meeting in the latter case the western or foot wall, a well-defined boundary plane of diorite ordinarily. From this cross-cut galleries, known as drifts, were extended through the lode lengthwise or in a direction approximately north and south, and cross-cuts from these galleries at varying or regular intervals explored the lode more or less thoroughly and determined the existence of ore-bodies in the gangue. Winzes, or galleries cut at different angles from one level to another, completed the scheme of exploration and secured more perfect ventilation throughout the mine. Main working drifts were six feet high in the clear, from 3½ to 4 feet wide at the top and somewhat more at the bottom, supported when necessary by timbers from 8 to 12 inches square. Temporary prospecting drifts and winzes were, however, much smaller, and generally left untimbered if practicable.[3] When a shaft reached the hanging wall of the ledge, which it was constantly approaching, as a perpendicular projected from a base line approaches a hypothenuse drawn at an angle of 45° from the same base, its course was commonly changed to conform with the dip of the ledge, and it was thereafter known as an incline. This incline might be continued indefinitely, or a new shaft cut from a point still farther to the eastward and the same plan of exploration adopted. Cross-cuts and drifts were extended from the incline levels as from the shaft and the method of ore extraction was the same. Against the disadvantages of hoisting ore around the angle formed by the shaft and incline was balanced the expense of constructing a new shaft and of excavating cross-cuts to the hanging wall. The character of the rock through which the incline must needs pass, and the comparative perfection of the ventilation, generally decided the question in favor of the vertical shaft.

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[1] Territorial Enterprise, April 22, 1863.

[2] San Francisco Evening Bulletin, April 25, June 20, 1862; Virginia City Territorial Enterprise, May 22, June 13, 1862.

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[1] Annual Report, Savage Mining Company, 1866, p. 14.

[2] Report of United States Mining Commissioner, J. Ross Browne, 1867, p. 344.

[3] *Ibid.*, p, 345.

As steam-power hoisting-engines gradually replaced the windlass and whim, iron-frame cages from 4½ to 6 feet high were used instead of the clumsy iron-bound bucket or skip.[1] Wooden guide-rails on the sides of the shaft-compartments regulated the motion through the shaft, and loads were raised and lowered which could not be placed safely in the swaying, dangling bucket. Round iron-wire ropes were substituted in some mines for hemp cables, but with indifferent success, owing to the poor quality of the material and the faulty design of the reel.[2] In September, 1863, the first flat iron-wire rope was made by A. S. Hallidie & Co., of San Francisco, for the Sierra Nevada Mine. It was woven in two coils, each 700 feet long, and was 4 inches in breadth by ½ inch in thickness.[3] It was warranted to raise 10 tons, and was an important improvement upon the ropes in ordinary use, as it was less liable to slip on the barrel of the reel and a cage could thus be lowered more steadily. Cables of similar design, but made of braided steel wire, were adopted later by the Savage, Hale & Norcross and a majority of the other mines on the lode.[4] Small sheet-iron cars were loaded with ore or waste rock at the slopes and pushed over wooden tracks shod with iron on the floors of the mine galleries to the stations at the different shaft levels, where the cage received and raised them successively to the surface. The average weight of a car load of ore was 1,400 pounds,[5] and as the cages in common use until 1871 had only one compartment it was necessary to raise the cars singly.[6] The average speed of hoisting was 700 feet per minute,[7] and 400 tons in a day of twenty-four hours was esteemed an extraordinary amount to extract and raise to the surface through one shaft. This was done by three shifts of miners, working eight hours severally, under the direction of foremen or "shift bosses." In earlier years the working time had often been extended to ten hours, particularly by the smaller companies and individual owners; but in 1866 eight hours' work had become a uniform requirement throughout the district. By the spring of this year, also, the mines had fairly assumed the appearance of a connected system, developed continuously; and it is of interest to compare their respective work and product:

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[1] Gold Hill News, April 23, 1864.

[2] Andrew Fraser, Virginia City, Nevada.

[3] A. S. Hallidie, San Francisco, Cal.; Territorial Enterprise, September 13, 1863; January 1, 1864.

[4] Gold Hill News, December 19, 1867.

[5] Report of United States Commissioner of Mines and Mining, 1867, p. 345.

[6] Gold Hill News, May 24, 1871.

[7] United States Geological Exploration of Fortieth Parallel, vol. III, Mining Industry, p. 141.

GOLD HILL MINES.[1]

Name of Mine.	Number of men employed during February, 1866.	Number of tons ore raised daily.
Bullion	28	————
Exchequer	20	————
Alpha	50	75
Imperial	75	150
Bacon	30	75
Empire	49	65
Eclipse	27	40
Stevenson	27	20
Consolidated	38	100
Piodo	16	60
Challenge	48	50
Confidence	41	55
Burke & Hamilton	9	10
Yellow Jacket	180	175
Kentuck	11	10
Crown Point	75	75
	724	960

VIRGINIA CITY MINES.[1]

Name of Mine.	Number of men employed during February, 1866.	Number of tons ore raised daily.
Ophir	45	30
California	6	10
Gould & Curry	245	215
Savage	175	90
Hale & Norcross	30	40
Chollar-Potosi	160	90
	668	475

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[1] Mining and Scientific Press, March 3, 1866; from Gold Hill News.

The total amount of ore taken out in Virginia City and Gold Hill daily, according to this statement, was 1,435 tons, which at an average milling value of $28 per ton would yield $40,180. The monthly yield at this rate would be $1,205,400, which was a close approximation to the actual product; for the yield of the lode during 1866 was reported by the United States Commissioner of Mines and Mining to be $14,167,071.55—a substantial verification of the record in the Gold Hill News.[1] This bullion product was nearly as great as that of any previous year, though the assay value of the ore extracted had steadily diminished since 1860, and if the cost of extraction and reduction had not been cut down correspondingly work in a number of the mines would have been carried on at a loss. The rich sulphurets of the Ophir and Mexican mines, yielding $3,000 to the ton, had been soon exhausted, and the bonanza of the Gould & Curry Company, the milling value of whose ore in 1862 was $104.50 per ton, furnished ore in 1866 of only one-third of this value ($36.90 per ton);[2] but while the cost of extraction in 1862 was fully $12 per ton and of reduction $44.48 per ton, these items had fallen in 1866 to $7.86 per ton and $13.57 per ton respectively,[3] for the miners in the service of the Gould & Curry Company were extracting $1\frac{13}{100}$ tons of ore daily to the man

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[1] Report of United States Commissioner, J. Ross Browne, 1867, p. 369.

[2] Report of United States Commissioner of Mines and Mining, 1866, pp. 78, 80.

[3] [Third Annual Report, Gould & Curry Silver Mining Company.]

Number of tons ore extracted during 1862, in round numbers, 9,000.

COST OF EXTRACTION, 1862.

Lumber and timber at mine	$26,149 57
Labor and salaries	53,405 07
Materials for mine	7,307 17
Expenses at mine	10,478 85
Freight for mine	13,925 77
Cost of extracting 9,000 tons	111,266 43, or

$12.36 + per ton, without deducting cost of prospecting and dead-work.

COST OF REDUCTION, 1862.

Number of tons reduced from December 16, 1861, to December 1, 1862, 8,427.

Materials for process	$42,282 22
Quicksilver	7,679 84
Working ores	324,889 39
Cost of reducing 8,427 tons	374,951 45, or

$44.48 + per ton.

[Seventh Annual Report, Gould & Curry Silver Mining Company, p. 30.]

	Per ton.
Cost of extraction, 1866	$7 86
Cost of reduction, 1866	13 57

(Cost of reduction, Gould & Curry Mill, 1866, $12.27 per ton; in custom mills, $15.67 per ton; average cost of reduction, $13.57 per ton.)

by the aid of two hoisting-engines and other mechanical appliances. The ore-body, it is true, was easily quarried and the depth of profitable working did not exceed 300 feet (though the shaft was sunk to the depth of 722 feet and several stations opened);[1] but the record is nevertheless a remarkable one contrasted with the results obtained in the mines of other districts, for many of the miners were engaged in prospecting the lode. In the same year the United States Commissioner of Mines and Mining reported that 20 men in the Comstock Mines could accomplish as much as 100 in the mines of Mexico,[2] and this is perhaps not an exaggerated estimate. Thus the high cost of labor was offset by energy, skill, and machinery, and the relative cost of production was, perhaps, in favor of the Comstock Mines. The cost of reduction was still disproportionate and excessive, yet no slight progress was shown in the efficiency and cheapness of the milling process, for the cost had been diminished at least one-half and the percentage of bullion extracted had increased fully one-fourth.

The 46 mining companies working on the lode in 1866 had 44 engines in place for hoisting and pumping,[3] and in the autumn of the same year 62 mills, by careful count, were employed in reducing ore from the mines, running 1,271 stamps and 919 pans, which crushed and amalgamated 57,112 tons of ore monthly.[4] During the six years following the discovery of the lode (1860–'65 inclusive) about 28 miles of tunnels and drifts had been excavated and about 5¾ miles of shafts, winzes, and inclines, exclusive of stopes and ore-chimneys, entailing fully as much work, giving a total of 57½ miles, according to the estimate of the State Surveyor General.[5] Certainly such an exhibit is a record of mining enterprise and energy which, considering the drawbacks of inexperience and locality, stands without a parallel.

Yet the progress made in the development of the Comstock Lode mines during these years was not the only result of the discovery nor the most important one; for, incited by the rewards of the new industry and the hope of similar bonanzas, swarms of prospectors set out from this district as a centre to search for ledges in every direction. The bounding circle of their exploration constantly expanded, and newly organized districts extended like the rays of a star from its nucleus. When one of these outlying districts promised unusually rich returns, like the Reese River region in the spring of 1863, a rush followed which made it teem with prospectors for a few months, and then it in turn served as a base of supplies and was encircled by outlying camps. Sometimes the rush was rewarded by actual prizes, but commonly the movement and dispersion were rocket-like—a prolonged whir, a gleaming beacon, a moment of splendor as the centre of radiant stars, and then dwindling specks of faded glory succeeded by gloom and utter extinction. The Reese River district, or the Toiyabe range, was not such a treasure-trove as its explorers fancied—"a chain 200 miles in length, nearly every mile of which is rich as never hill or mountain was rich before;"[1] still the rush toward it was not wholly unrewarded. From Austin, in the heart of the range, districts radiated like the spokes of a wheel; southwest lay Ione, Union, and Mammoth; west, Augusta and Cold Spring; northwest, Ravenswood; northeast, Cortez; southeast, Jefferson and others; east, Mountain, Eureka, Diamond, and Gold Cañon, chief among scores of others then notable, now nameless and forgotten.[2]

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[1] Seventh Annual Report Gould & Curry Mining Company, December 17. 1876.

[2] Report of United States Commissioner, 1866, p. 72.

[3] Report of State Surveyor General, 1865.

[4] Mining and Scientific Press, September 29, 1866.

[5] Report of S. H. Marlette, Surveyor General. for 1865.

In this way Nevada was explored; nor was the quest limited by the confines of the Territory. From California and the older States of the Mississippi Valley venturesome prospectors crossed and recrossed the intervening tract of deserts and mountain ranges in the Great Basin. Before the discovery of the Comstock Lode their efforts had been mainly directed toward the discovery of gold placers; but incited by the reported yield of the quartz mines in California and Nevada, the mountain ranges were searched for ledges no less diligently than the ravines were scoured for gold dust. In the basin east of Nevada the search was not well rewarded. Some developments were made in the Rush Valley district in Utah and smelting-works were erected, but the process failed to extract the precious metals satisfactorily, and owing to the expense of production the work was unprofitable.[1] North of the Nevada boundary line better results were attained. In Montana the first rude quartz-mill was erected in the Bannock district during the winter of 1862–'63. Its iron work was fashioned in a blacksmith shop from the wrecks of old wagons, and much of the wood-work was obtained from the same source; yet it reduced the rich ore of the Dakota Lode with considerable profit, wherein it outdid the early workings of the more pretentious steam stamp-mills erected in 1864.[2] The quartz veins of Owyhee and Alturas districts in Idaho began to attract attention in 1864, and productive mines were then first opened in that Territory.[3] South of Nevada districts were organized in 1862, along the valley of the Colorado River, and the mines of central Arizona were opened in 1863.[4]

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[1] Reese River Reveille, in Territorial Enterprise, October 7, 1864.

[2] *Ibid.*

On the western slopes of the Rocky Mountains the influence of the Nevada silver discoveries was no less noticeable in the stimulus thereby given to the search for deposits of the precious metals. Gold placer discoveries attracted a swarm of prospectors to Colorado in 1859, as many parts of the Territory had been explored by gold hunters during the previous year. On the 6th of May, 1859, the Gregory Lode, in Gilpin County, was located and the foundation thus laid for the towns of Central City and Black Hawk.[5] Seven years later the richness of the great silver-ledge belt on the western slope of the Rocky Mountain range was made known generally by the display at the Paris Exhibition of masses of silver ore from the Argentine and Griffith districts in Clear Creek County, and the search for silver-bearing quartz ledges was renewed with fresh energy and richly rewarded.[6]

The knowledge of the mineral riches of New Mexico was obtained rather from desultory observation than systematic working, but sufficient information was furnished to warrant a strongly-worded report from Commissioner Taylor in May, 1868, commending the ledge developments to the attention of capitalists.[7]

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[1] Report of United States Commissioner, J. Ross Browne, 1867, p. 484.

[2] *Ibid.*, p. 498. [3] *Ibid.*, 1866, p. 36. [4] *Ibid.*, 1867, pp. 459–466.

[5] Report of T. W. Noyes, Special Agent, 10th Census, 1880.

[6] Report of United States Commissioner, James W. Taylor, 1867, p. 9. [7] *Ibid.*, pp. 4, 5.

CHAPTER XII.

THE CONTEST WITH WATER.

The yield of the silver mines of outlying Territories was, however, prospective rather than actual. Nevada was incontestably the main silver-producing region, and within its limits the Comstock Lode district maintained its foremost position undisputed, both in productiveness and development. Progress was here made, moreover, in the face of an actively-resisting obstacle. The delays in the development of the mines which were occasioned by ignorance or heedlessness, by insufficient timbering, and ill-judged attempts to explore the lode, were few and transitory compared with those caused by the influx of water, the arch enemy of miners from earliest history. Gamboa names it as a principal cause of the abandonment of most of the ancient mines of Spain, and predicts the decadence of the most populous and productive mining districts in the New World because of the violation of the Crown ordinances requiring the construction of efficient systems of drainage.[1] The deluge which closed the Real del Monte Mine, in Durango, for fifty years;[2] the inundation of the famous mine of Quebradilla in Zacatecas; the endless contest with inpouring floods at the rich mines of Guanaxuato, and a hundred similar instances enforced his warning. The mines of the Comstock Lode met this adversary at the very outset of their undertaking. How the Union Tunnel and other adits of its class were cut during the year 1860 as artificial channels of drainage has been briefly narrated. For a year or two the water was controlled by means of these outlets and the simple windlasses which hoisted buckets laboriously to the surface. As the shafts progressed in depth longer adits were cut at points nearer the foot of Mount Davidson, the Yolo,[1] Cedar Hill,[2] Kenosha,[3] United States,[4] Mount Davidson,[5] Granada,[6] Caledonia,[7] Gold Hill,[8] Santa Fé,[9] Latrobe,[10] and others, ranging from 700 to 3,300 feet in length, which pierced the lode at different points and served as drainways for the water. Small pumping engines were also set up at the principal shafts on the lode, twelve being in place at the end of the year 1862,[11] so that by these combined methods the mines were kept comparatively free of water until 1864; but this fortunate condition was partly due to the fact that the miners dreaded the probable reservoirs of water which were pent up in unseen chambers within the ledge and cut their way carefully, passing by ominous partitions of clay, which experience had taught them were natural bulkheads, and turning aside from the wettest portions of the lode. Carelessness in this regard proved disastrous more than once, as when a miner drove his pick through a clay seam in a cross-cut of the Ophir Mine, at a point 313 feet below the surface, January 18, 1863, and a spout of water followed the blow which forced the miners to drop their picks and fly for their lives.[12] Fifty hours after its outburst the water had formed a subterranean lake in the mine 21 feet deep by 30 in width and 100 feet in length. In spite of the suction of the pumps, which were worked to their full capacity, the water steadily rose in the mine and was only checked by means of additional pumps in the Ophir Mine and the use of a bailing-tank in the Mexican Mine adjacent, which lifted 7,020 cubic feet of water per day. Five months later, in July, 1863, the stream still continued flowing in considerable volume, and a shaft sunk to the depth of 100 feet below the cross-cut (313 feet from the surface) was abandoned on account of the further influx of water until the Latrobe Tunnel reached that section of the lode.[1]

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[1] Gamboa's Commentaries, Heathfield's Translation, vol. II, pp. 305, 306.

[2] London Quarterly Review, April, 1864.

The Ophir Mine was undoubtedly more troubled by floods than any other productive mine in the district; but during 1864 the small pumps and hoisting-tanks on the line of the lode proved insufficient, and a general substitution of new and more powerful engines was begun. When the Best & Belcher Company started their new pump of 12-inch bore, April 26, 1864, the water in their main shaft was 30 feet deep and work had been suspended for some time.[1] The Crown Point Company gave up the attempt to lower the water in their shaft June 10, 1864, for their engine could only keep the water 2 feet below its natural level, 80 feet above the bottom of the shaft;[2] the Overman Mining Company suspended operations during the same month, as the water flowed into their shaft so rapidly that they were unable to continue work until a recently ordered pump had been set in place;[3] and in the Yellow Jacket Mine a body of water was tapped at a depth of 317 feet below the surface, July 6, 1864, which entered the shaft as a stream 2½ inches in diameter, filling the works to a depth of 20 feet, its natural level, and constraining the company to put a pump in place at once.[4] The Belcher,[5] Uncle Sam,[6] and Justice[7] mines were almost equally afflicted by the water-plague, and the mines scattered over the basin called American Flat, a mile southwest of Gold Hill, were compelled to suspend work with scarce an exception for the want of adequate machinery to cope with the same obstacle.[8]

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[1] Gold Hill News, December 10, 1863.

[2] Territorial Enterprise, February 2, 1861.

[3] Territorial Enterprise, March 23, 1863.

[4] *Ibid.*, March 26, 1863.

[5] *Ibid*, June 15, 1861.

[6] San Francisco Evening Bulletin, February 19, 1861.

[7] Gold Hill News, May 20, 1864.

[8] Gold Hill News, June 17, 1864.

[9] Territorial Enterprise, May 14, 1863.

[10] Territorial Enterprise, August 22, 1866.

[11] Sacramento Union, December 24, 1862.

[12] Territorial Enterprise, January 21, 22, 1863.

[13] Mining and Scientific Press, July 27, 1863.

At the northern end of the lode the plague had in no degree abated. The Ophir Company had just succeeded in pumping out the reservoir opened in January, 1863, and begun drifting again, when, on the 25th of December, 1864, another great "water-pocket," so called, was tapped at a point 25 feet above the foot of the shaft.[9] It rushed in with such force that the men in the shaft at the time narrowly escaped death by drowning, and on the following day it had risen to the height of 160 feet. This was even more discouraging than the previous flood, and the apprehensions of observant stockholders in mines on the lode were not allayed by the report of the superintendent of the Belcher Mine, twelve months later, showing, as it did, in unmistakable terms, how formidable the great adversary of mining had become; for, though the Belcher Mine pump was discharging 1,017,878 gallons every 24 hours, yet work on the 520-foot level of the mine had been stopped for nearly three months, as it was impossible to make any headway until the 420-foot level was at least partially drained of the water which was constantly entering.[1]

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[1] Gold Hill News, April 28, 1864.

[2] *Ibid.*, June 11, 1864.

[3] *Ibid.*, June 20, 1864.

[4] *Ibid.*, July 6, 1864.

[5] *Ibid.*, June 13, 1864.

[6] *Ibid.*, June 20, 1864.

[7] *Ibid.*, June 14, 1864.

[8] *Ibid.*, May 18, 1864.

[9] Territorial Enterprise, December 27, 1864.

A cheap and effective method of freeing the mines from water was urgently needed. Drainage by tunnels is always the most effective and usually the cheapest, when the topography of the surrounding country admits of their excavation. This principle was clearly recognized by the mining companies, and tunnels had been cut to pierce the base of Mount Davidson on a level with the head of the cañons; but when the shafts passed this level the tunnels no longer afforded a free outlet for the water encountered, and it was necessary to resort to pumps which could hardly cope with the influx. In this emergency the practicability of cutting a drainway to enter the lode at a deeper level became a question of the first importance and interest. The Gold Hill and Virginia Tunnel and Mining Company answered it by beginning the construction of a tunnel on the west side of Gold Cañon, nearly a mile below Gold Hill, in the summer of 1863, to pierce the Comstock Lode at a depth of 800 feet, and extend north below Virginia City. In May, 1864, it had been advanced 840 feet, being 7 feet wide at the bottom, 6½ feet high, and 6½ feet wide at the top. The paralysis of the mining industry in the summer of 1864, consequent upon the panic in the stock market, affected this work so seriously that the project was not carried out, and when a revival of the plan seemed probable, a new design of extraordinary proportions was brought to the attention of the mining public which effectually blotted out of mind its humbler rival.

By an Act of the Nevada State Legislature, approved February 4, 1865, the Sutro Tunnel Company was incorporated, and the exclusive privilege granted for the ensuing fifty years to construct and excavate a tunnel extending from the foot-hills of the Carson Valley at any point between Webber and Corral Cañons to the Comstock Lode. The proposed length of this adit was more than 3 miles—20,489 feet, as finally determined[2]—and it would cut the lode at a depth of 1,663 feet 8 inches below the top of the nearest mine shaft, that of the Savage Mining Company. The trustees and incorporators of the Tunnel Company were Adolph Sutro, William M. Stewart, D. E. Avery, Louis Janin, and H. K. Mitchell. Mr. Stewart was the president of the company, but its originator and moving spirit was Adolph Sutro, who then first came to the front as a leading actor in the drama of mining industry daily enacted on the lode. His clear and trustworthy account of the singular battle at Pyramid Lake in 1860 has been already noted, and he had been an interested and intelligent observer of the mining operations on the lode, advocating, early in 1860, the desirability of developing the mines by means of adits, but had taken no active part in this work. The owner of a quartz-mill on the Carson River, which required his personal attention, he naturally remained aloof from the contests which convulsed the district during the early years of its history; but when the Territory became a State, and the mining companies on the lode, weary of the interminable litigation, were compromising and adjusting their disputed claims, Mr. Sutro grasped the favorable opportunity and presented his great plan for the development of the mines. Securing the powerful support of Senator Stewart, who was never slow to recognize the advantages and possibilities of great conceptions like this, Mr. Sutro succeeded in obtaining a charter for his company from the first State Legislature of Nevada, and secured contracts in April, 1866, from 23 of the principal mining companies, representing 95 per cent. of the market value of all the mines on the Comstock Lode at the time.[1]

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[1] Report of Jno. Lambert, Superintendent Belcher Mining Company, December 26, 1865; Territorial Enterprise, December 29, 1865.

[2] George J. Specht, C. E., Sutro Tunnel Company.

By these contracts the companies which signed the articles of agreement bound themselves to pay the sum of $2 for every ton of ore extracted from their respective mines, after the extension of the tunnel and its lateral drifts to designated points within their boundaries, which excavation was held to constitute an effective drainway.[2] The privilege was granted to the companies of transporting men, ore, waste rock, timbers, tools, and other materials through the tunnel on payment of stipulated sums.[3] It was provided that the tunnel should not be less than 7 feet in height and 8 feet in width in the clear, with a grade of not less than 1 inch to the 100 feet. To guarantee the completion of this drainway within a reasonable term of years the Sutro Tunnel Company contracted to secure subscriptions amounting to $3,000,000 before the 1st of August, 1867, and to expend a certain sum annually thereafter in prosecuting the work.[1]

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[1] Bank of California against the Sutro Tunnel: Argument and Statement of Facts, p. 17.

[2] *Ibid.*, p. 15.

[3] *Ibid.*, p. 14.

The project then assumed a form which could be presented to the attention of capitalists in this country and abroad; but there was some question in regard to the power of the State Legislature to grant the valuable privileges conceded to the Sutro Tunnel Company, involving as they did the disposal of a portion of the mineral lands reserved to the United States. The mining companies on the lode were, moreover, legally in the position of mere squatters on the land, and their agreement to pay certain rates, when their possessory titles were still unconfirmed, was not a sufficient guarantee to warrant the investment of capital in the enterprise. Recognizing these facts, the Tunnel Company took measures at once to secure their rights under the State franchise and the later contracts by obtaining the passage of an act by Congress, approved July 26, 1866, granting to Adolf Sutro, his heirs and assigns, the right to construct a mining, draining, and exploring tunnel to and through the Comstock Lode from the foot-hills near the Carson River, together with other valuable privileges, and making the tenure of all mines on the Comstock Lode subject to the conditions expressed in such contracts as had been or should thereafter be made between the Sutro Tunnel Company and the mining companies representing a majority of the estimated value of the Comstock Lode at that time, July 26, 1866.

So far Sutro had been aided by powerful co-operation and had met little or no opposition. His company was duly organized and its rights and privileges fully determined and confirmed. The prosecution of the enterprise was assured as soon as the requisite capital, the one thing needful, had been subscribed. Under the provisions of the contracts it was necessary for the company to secure $3,000,000 in subscriptions to its capital stock before the 1st of August, 1867, and Sutro accordingly went directly to New York from Washington after the passage of the tunnel act, and endeavored to interest the leading merchants, bankers, and other capitalists of the city in his undertaking.[1] The Comstock miners were then comparatively unknown in the Eastern States, the probable magnitude and continuance in depth of the lode were not sufficiently demonstrable, Eastern capitalists were slow to invest in distant mining operations at all, and the prospective profits of the Sutro Tunnel appeared to them vague and uncertain, while the admitted cost of the undertaking was clearly immense. Under these drawbacks he showed marked ability as a financial agent in obtaining attentive consideration for his scheme and a virtual pledge from a number of capitalists that if he would get a preliminary subscription of a few hundred thousand dollars on the Pacific coast they would secure three millions additional in the East. With this guarantee he returned to California and submitted the results of his negotiation to the mining companies interested in its success. He showed them that by becoming owners in the tunnel enterprise they might receive in dividends all they would be obliged to pay out in royalties for the ores removed when their mines were productive; and that when their mines became barren from time to time, the dividends from the tunnel stock would furnish the means of prospecting. His arguments, whether valid or not, were so convincing that $600,000 was subscribed conditionally by the mining companies on the lode before the end of May, 1867,[2] and an extension of one year's time in which to secure the additional capital needed was granted to him by eleven companies, the product of whose mines in 1867 was 71 per cent. of the total yield of the lode for that year.[3] As a further assistance in obtaining funds for his work the Nevada Legislature had listened to his representations and petitioned Congress in January, 1867, to grant such material aid as would secure the speedy construction of the Sutro Tunnel, representing this work to be of the first importance to the mining interests of the whole country and certain to increase the revenues of the nation.[4]

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[1] Bank of California against the Sutro Tunnel: Argument and statement of facts, p. 12.

The tunnel scheme was blossoming rarely and the fruit was all but plucked, in anticipation, when a sudden frost blighted the opening buds.

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[1] The Sutro Tunnel, Edition 1872, p. 672.

[2] *Ibid.*, p. 673.

[3] Bank of California against the Sutro Tunnel, p. 18.

[4] *Ibid.*, pp. 33, 34.

The mining companies on the lode canceled the subscriptions made by their trustees to the stock of the Tunnel Company, and the pledge of the New York capitalists was practically annulled in consequence. The announcement of this action was a bitter disappointment to Mr. Sutro. He had worked with tireless energy to achieve success and was just raising the cup of fruition to his lips, as he thought, when it was dashed to the ground. To most men this reverse would have been a crushing blow; to Sutro it was only a stinging goad. Smarting under the sense of injustice he began, almost single-handed, a war offensive and defensive against the controllers of the Comstock Lode. In this contest his indomitable energy, his tenacity of resolution, and his fertility of resource extorted the admiration of even his bitterest opponents; yet the result of the contest at the outset appeared a foregone conclusion. Senator Stewart had resigned his position as president of the company,[1] and the burden of the struggle fell on the shoulders of Sutro alone. The cost of excavating the tunnel was estimated at from $4,000,000 to $5,000,000, and he was obliged to secure this great sum in the face of an organized opposition. Drainways and sewers have been constructed before, while many of those directly benefited by the work were reluctant to contribute toward their execution, but never before had a tunnel been cut to develop or drain a line of mines whose owners unanimously objected to its extension; nor was this antagonism a tacit or passive one. The subscriptions were formally repudiated and the influence of the combined mining companies, supported by the great financial power of the Pacific Coast, the Bank of California, was brought to bear actively, directly and indirectly, against the efforts of a single man to secure help from private investors or from Congress in the prosecution of his extraordinary undertaking.

What was the reason of this formidable opposition? It was ostensibly based on two main grounds—alleged distrust of Sutro as financial agent and manager of the Tunnel Company and the belief that the tunnel itself was unnecessary or that the tribute exacted from the mines was an exorbitant tax for the service rendered.[2] The cause of this suddenly-professed distrust of Sutro is not apparent. In May, 1866, as appears from the letter of the cashier of the Bank of California to the Oriental Bank Corporation of London, England, the tunnel scheme was commended strongly to the attention of investors in the United Kingdom, and its advocate was introduced as an agent deserving of confidence.[1] In January, 1867, the thanks of the Legislature of Nevada were cordially extended to Adolf Sutro for his "great service" in originating the Sutro Tunnel scheme[2] and urging forward the undertaking; and the same legislature expressed their entire confidence in the ability of Mr. Sutro to present the enterprise to Congressmen and capitalists in its proper light without overlooking or exaggerating any of its merits; nor was it possible to maintain in May, 1867, what was alleged publicly at a later date (April 15, 1872), that 704,883 shares, or more than half out of the total capital stock (1,200,000 shares), had been issued up to August 19, 1871, while only $42,800 had been spent in the construction of the tunnel up to July 1, 1871.[3] The sole tangible reason for the lack of confidence professed was the failure of Sutro to raise the sum of $3,000,000 stipulated in the contracts, by sale of stock, within the time first named—one year from July 31, 1866. This failure was admitted; but Sutro was able to rejoin with truth that the repudiation of the subscriptions by the mining companies prior to the expiration of the time conceded to him by contract was a fatal obstacle to his attempts to raise the stipulated sum within the allotted time, and that the extension of his privilege for a year longer, granted by eleven companies of the twenty-three original signers of the contracts in April, 1863,[4] would have enabled him to secure the sum named, in all probability, if the twelve remaining companies had been equally liberal. The companies were of course not bound to make this extension or to ratify subscriptions pledged conditionally by their trustees; but some other cause must be assigned for their action than the professed distrust of Sutro as a competent financial agent. His success in negotiating the sale of the tunnel stock during the year 1866 was, under the circumstances, remarkable.

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[1] William M. Stewart.

[2] William E. Sharon; I. L. Requa.

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[1] The Sutro Tunnel, p. 860.

[2] The Bank of California against the Sutro Tunnel, p. 34.

[3] The Sutro Tunnel, p. 858; Argument of Mr. Thomas Sunderland, Attorney for Comstock Lode Mining Companies.

[4] Bank of California against the Sutro Tunnel, p. 18.

The second reason assigned for the withdrawal of the support of the mining companies remains to be examined—the alleged unserviceability of the proposed tunnel. In 1866 its value as a drainway, at least, was generally recognized; in 1867 this special utility was seriously questioned. It was averred that the original contracts had been made by the mining companies at a time when the amount of water encountered by the miners on the lode was a baffling obstacle to the progress of exploration; but a year later this dangerous water-belt had been passed, as was maintained, by the deeper shafts, which were entering a comparatively dry section of the lode. It is doubtful whether sufficient progress had been made in May, 1867, to confirm any such conclusion; but men are sometimes able to persuade themselves of the truth of a proposition which they are anxious to believe without sufficient evidence. The mine managers hoped that the quantity of water in the lode would decrease as the depth of the workings increased, because the annual rainfall in the district was extremely light, and they presumed that the surface water would be gradually absorbed, arrested, and diverted in its passage downward through the lode. They did not consider fully the porous character of the decomposed feldspathic rocks which formed so large a proportion of the earth-crust throughout the district, or estimate the aggregate volume of the filtration since the formation of the fissure; yet it was certain that the progress of the development of the lode, as a whole, was less impeded by water in 1867 than in the preceding year. From the lack of any complete or trustworthy statistics it can never be determined satisfactorily whether the amount of water raised in 1867 differed materially from the quantity pumped out in 1866, but it was assuredly removed more rapidly and easily.

Four years of experience had taught valuable lessons, and the pumps set up during 1866 on the line of the lode were powerful enough in most instances to cope with the water. The little pumps and hoisting-tanks used at first were discarded, and the shiftless method of sinking shafts and relying on chance to avoid a water-chamber was generally abandoned. The water was confessedly a most formidable antagonist along the whole line of the lode, and its power was more nearly measured. It was known that the relief proposed by the tunnel would be a slow remedy, and that for several years certainly pumping-engines would be the sole reliance; therefore the attack upon the water no longer resembled the efforts of Mrs. Partington with her mop, but was well supported and effective. The Gould & Curry Mine, for example, had been one of the wettest on the lode, and work in its new shaft, the Bonner, had been suspended during 1866 because of the inpouring floods of water; yet when a 120-horse-power engine was set up in December, 1866, and pumping actively resumed, the water which stood more than 100 feet deep in the shaft was soon lowered to its bottom at the 725-foot level, and progress in depth was again practicable. Sufficient advance was made in this and others of the deeper shafts during the next six months to assure the superintendents that they were at least holding their own in the contest, even if they were not entering a drier belt of rock, as was generally supposed.

If the water could then be held in check or mastered by pumps without the aid of the tunnel, the only question which the mining companies had need to consider was whether the cost of pumping was likely to be greater or less than the tribute which they were obliged to pay for the service of drainage of $2 for every ton of ore raised. While the mines were barren this service would be performed gratuitously, and the contract would be wholly favorable to the mining companies; but when the mines were productive it was alleged that the profits of the Tunnel Company would be far in excess of the value of the service rendered; for, except as a drainway, the utility of the tunnel to the mine stockholders was not clearly demonstrable. As a method of ventilating the mines it did not commend itself especially. It would provide no means of escape for the miners in the event of danger by flood or fire which connecting galleries from shaft to shaft would not afford.[1] It would offer a convenient mode of access to reduction-works on the Carson River, but it was doubted whether such works would increase materially the profits of the mine stockholders, though they might occasion serious loss to the mill-owners of the district. Furthermore, all the mine stockholders were not favorably impressed with the representations of Mr. Sutro, that the necessity of levying assessments might be partially avoided through the income of shares in the Tunnel Company. Many desired to buy and hold the stock of a given mine only when that mine was in bonanza, and intended to dispose of their shares at a premium before the known ore-body was completely exhausted. To prospect barren mines, or to contribute for that purpose, was foreign to their design, and when their mine was productive a tax of $2 per ton was esteemed a costly tribute to the Tunnel Company, unless it could be shown that the current expenses of pumping would be greater than the amount paid for the other system of drainage. If it had been the common practice to hold the stock of a given mine continuously as a permanent investment, the proposition to hold tunnel stock in conjunction with it might have been viewed more favorably, as the outlay required would have included the first cost of the pumping machinery as well as the expense of maintenance and use; but as mining shares were bought very largely for speculative purposes or as temporary investments simply, the cost of the standing plant and the future needs of a mine were not commonly considered; for the market value of the Comstock Mines depended little upon their assets represented by plant, and as long as the working machinery was fairly serviceable, stockholders for a day did not trouble themselves to inquire how long it would last or what would be the expense of its replacement. This standpoint was undoubtedly a narrow and self-interested one; but as mining is presumedly a speculation and not a philanthropic enterprise, investors have clearly the right to buy and sell as they choose. It was contended by some, also, that the shafts of the leading mines would be extended considerably below the level at which the Sutro Tunnel would enter the lode before it could possibly be completed. Hence the tunnel would not drain these mines completely without the aid of pumps if water was encountered in the lower levels, and the cost of maintaining and operating an expensive mine-plant must still be defrayed in addition to the tribute paid to the Tunnel Company. Others, again, were unwilling to make contracts in the dark, as it were, while the quantity of water which would be drained from the lode by the tunnel was absolutely unknown, and the true value of the service was consequently undetermined. If the tunnel should be found necessary or serviceable when constructed, they were, of course, ready to pay whatever its service was worth, but did not care to estimate that service at so high a rate in advance. Perhaps, if they made no guaranty, the tunnel might never be constructed, but they were prepared to take this risk and suffer whatever losses might befall them from the lack of such a drainway.

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[1] The Sutro Tunnel, pp. 26–44. Official Letters to Brevet Major General H. G. Wright, Senior Officer, Sutro Tunnel Commission; from Superintendents of the Ophir, Gould & Curry, Hale & Norcross, Savage, Chollar-Potosi, Imperial & Empire, and Yellow Jacket Mining Companies.

The wish to terminate the contracts with the Sutro Tunnel Company was not inexplicable, therefore, on the ground of an honest change of opinion during 1866 and a more careful consideration of personal interests. The scheme had been thoroughly discussed and examined since it had been brought prominently before the public by the signature of the contracts and the act of Congress, and it is idle to affirm that the general opposition to the terms of the contracts when the subscriptions were repudiated, in 1867, arose at the nod of the Bank of California alone. This change of mind might be prejudicial to the Tunnel Company and Mr. Sutro's personal interests; but in so far as it was an honest decision, whether based on mistaken views of self-interest or not, the Tunnel Company had no ground for complaint. The disappointment to Mr. Sutro was a personal consideration entirely. The Tunnel Company had only themselves to blame for lack of foresight in contracting to raise the specified amount of capital in an inadequate time. If any persons advocated the repudiation of the subscriptions and opposed an extension of the time granted to the Sutro Tunnel Company for obtaining the stipulated capital of $3,000,000 in order to wrest the tunnel franchise from Mr. Sutro, their action is indefensible. If the influence of the Bank of California was exerted to this end, the course of its managers was supremely selfish. This point, however, has never been proved, and there is no satisfactory evidence of it extant, though Mr. Sutro was fully convinced that this was the secret of the formidable opposition arrayed against him. He refused to see that stockholders in the mining companies could honestly consider the tribute stipulated by contract an exorbitant tax and could heartily oppose the construction of the tunnel while this specification was in force. It might be supposed that the contracts were void through the laches of the Tunnel Company, and so the mining companies contended; but this point was never conceded by Mr. Sutro, and subsequent acts of Congress apparently confirmed his position, though a decision of the Supreme Court could alone determine the question finally; therefore, as long as the possibility of exacting this tax hung over the heads of the mine stockholders who questioned its justice, so long they fought strenuously against the tunnel project. Mr. Sutro could see, however, only one cause for the failure of his plans—the unscrupulous avarice of the Bank of California, a gigantic monopoly in his eyes, grinding the faces of the poor, and determined to crush out every enterprise which interfered with its scheme of oppression. He proclaimed his convictions earnestly and persistently, never losing an opportunity to assail his enemy and champion his own cause. Realizing the difficulties of his undertaking he worked day and night to overcome them[1]—visiting New York, Washington, London, and the European capitals, presenting and urging his project—inspecting the principal mines and studying their characteristics, obtaining the approval of his plan by eminent authorities in mining engineering abroad and in this country, and winning just praise for his personal enterprise and indomitable ardor. He wanted money, however, more than sympathy, and for some years he could get few cash subscriptions for the stock of his company. Meanwhile a great corporation was gaining an extended control of the Comstock Lode.

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[1] "The Sutro Tunnel," pp. 882, 883.

CHAPTER XIII.

A CONTROLLING COMBINATION.

The directors of the Bank of California had determined, in the spring of 1864, to establish a branch bank at Virginia City, and it was necessary for them to select some agent to whom this important trust could be confided. Their choice fell upon William Sharon, a comparatively unknown man, who had acquired a moderate fortune as a merchant in California but had lost it as a speculator in mining stocks. Yet though unsuccessful in his last venture he was by no means a man whom reverses of fortune could dishearten, nor was he disposed to abandon the hope of retrieving his losses in the same field of speculation. The cashier of the Bank of California had given him employment in adjusting some financial complications in Nevada which threatened to prove losses, and his able execution of this charge was undoubtedly the determining cause of his appointment as manager of the new bank establishment.[1] None saw in him at this time the destined successor of William A. Stewart as the dominating figure on the Comstock Lode. A small, though compactly formed, person, quiet in manner, and reserved to the point of coldness, he was to all outward seeming the antitype of the burly, frank-spoken, domineering lawyer, who was described with half indignant Washoe humor, reproducing something of the broad effects of a Rabelaisian sketch, as "towering above his fellow citizens like the Colossus of Rhodes, and having as much brass in his composition as that famous statue ever had." Yet points of similarity were not lacking. Both were men of strong will, positive opinions, and prompt action. Both were capable of forming large plans, and were alike fertile in expedients; but there the likeness ended. Mr. Stewart was impatient of opposition, and executed his measures with a directness and boldness which savored of recklessness. Mr. Sharon waited coolly, though not sluggishly, until in his judgment the time was ripe for action, relying rather on a quick perception to avail himself of the propitious moment than on a stubborn determination to constrain the smile of fortune. One was by nature a leader and an actor; the other was a director and a strategist. The advocate was always in the foreground; the financier was in the front or rear, as best suited his designs. The former might sometimes be blinded by passion to his own interests; the latter, never. In short, Mr. Stewart was the natural representative of the seething, unruly mining camp, disturbed by conflicting passions and factions, where the commanding presence of the individual counts for more than the abstract sovereignty of the law; and Mr. Sharon was, in a sense, the embodiment of a new period, where organization was to triumph over anarchy and cool calculations of self-interest were to be the only recognized basis of action. The budding of the new order of things may be fairly said to date from the appearance of Mr. Sharon upon the Comstock Lode in the spring of 1864, and after Mr. Stewart's election to the Senate of the United States from Nevada, December 15, 1864,[1] the unfolding of the bud was rapid.

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[1] Gold Hill News, November 21, 1874.

When the agent of the Bank of California came to Virginia City the local banking-houses were loaning money to the mill owners and other business men of the district at high rates of interest, ranging usually from 3 to 5 per cent. per month,[2] and it was commonly believed that they had entered into an informal agreement to fix and sustain this exorbitant tariff. Mr. Sharon at once offered loans on good security at 2 per cent. per month, and existing combination was dissolved in consequence. Mill and mine plant was accounted good security; and having faith in the value and development of the Comstock Lode he did not hesitate to make large advances to both mine and mill owners—by direct loans and by the allowance of overdrafts. There was a sharp competition among the mill-men to secure custom, but the charges for the reduction of ore were so high that the interest on the loans could be paid regularly while the mills were working continuously; but when the ore-supply failed from any cause, and mills were kept at work intermittently or stood idle, arrears of interest were allowed to accumulate, and in several instances mill owners were constrained to make over their property to the Bank of California in default of payment. The bank would undoubtedly have been willing to extend its accommodation to any reasonable point, as the mills while standing idle were simply a burden upon the corporation; but the mill-owners, in view of the uncertain prospect of obtaining ore enough for their needs, preferred to make an assignment of their mills rather than incur the accumulation of debt which threatened them. No property deteriorates more rapidly in value than mill property when in disuse. The expense of a watchman and the accumulating taxes and insurance dues must be paid. The heavy machinery, the pans, shoes, and dies require constant attention to keep them in good order; for if left without care they will rapidly rust and become unserviceable. The very framework of the mill, even, being frequently made of poorly seasoned or unfit stuff, will crack and warp if neglected, so that in a short time it must be extensively repaired or replaced. If, furthermore, the supply of ore should totally fail, the mill would become practically worthless no matter how complete and serviceable its machinery might be. Thus, in the White Pine mining district, a mill in perfect order which had cost $200,000 was offered for sale at $5,000[1] without finding a purchaser; and Mr. Sharon sold a mill near the Comstock Lode which had cost him $60,000 for one-twentieth of that sum.[2]

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[1] Territorial Enterprise, December 16, 1864.

[2] I. L. Requa and others.

The advances made by Sharon were amply covered by the estimated value of the mills while actively employed in filling profitable contracts; but when supplies of ore failed the bank was obliged to take possession of mill after mill in order to avoid the certain loss of a forced sale by auction. The first mill so acquired was the Swansea Mill, in Lyon County, in May, 1866,[3] and twelve months later seven mills were held by this corporation. The bank then considered it advisable to make some disposal of the property which had come into their hands; and upon Mr. Sharon's clear representation of the case it was determined by a number of the principal stockholders in the bank to organize a corporation, to be known as the Union Mill and Mining Company, who should purchase and manage the mill property held by the bank. This organization was effected in June, 1867, the charter members being D. O. Mills, William Sharon, Alvinza

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[1] Alpheus Bull, Trustee.

[2] William A. Sharon.

[3] I. L. Requa.

Hayward, Thomas Sunderland, W. C. Ralston, Charles Bonner, Thomas Bell, and William E. Barron.

The mills held by the new corporation were useless unless ore could be obtained in sufficient quantity to keep them at work, and it was considered that there was no reasonable certainty of this supply unless the ore-producing mines on the lode were controlled by the same capitalists who owned the mills. Thus the institution of what is popularly known as the fortified monopoly system on the Comstock Lode may be said to date from the formation of this corporation. It is not necessary to examine the general advantages and disadvantages of this system. The practical question of importance is evidently whether its establishment was prejudicial to the interests of the ordinary stockholder in the Comstock mines or to the development of the lode itself. Under some conceivable conditions the answer would be in the affirmative. Contracts for the reduction of ore might have been awarded to the lowest responsible bidder who would guarantee the best returns, and mills might have been built and conducted by trustworthy and competent agents of the mining companies, paid by fixed salaries or by percentages of profits. Either of these courses might have been adopted to advantage in some districts, but neither was chosen in the present instance, and to introduce either sweeping changes would have been necessary. The stockholders in the mines must have been persuaded to hold their stock as a permanent investment and not for speculative purposes merely, and officers, agents, and employés of the different companies must have been selected who would regard the interests of the corporate bodies, their employers, as paramount to their own. When stockholders are both greedy and careless they must expect that their agents will be equally selfish. The "piratical policy of gutting the mines," as Professor Raymond has concisely termed it, was advocated by the average stockholder even more strongly than by the directors whom he voted to place in office. Ore was taken out more rapidly than the mills of any company could reduce, and the exhaustion of the ore-body followed in consequence so soon that it was questionable whether the erection of mills by any company would prove a profitable investment.

The erection of a mill by a mining company is to be advocated ordinarily when the difference between the cost of reducing the body of ore in sight in custom mills and in the proposed corporation mill will defray the expense of its construction. Now, if this ore is parceled out to custom mills before the corporation mill is built, as was urged by the impatient stockholders in the Comstock Mines, it is difficult to fix a time when the erection of a mill by a company is justifiable. Moreover, when a corporation mill was actually erected it could only be managed successfully by thrifty, honest, and competent agents, and such men could not always be readily secured. "Like master, like man," has often been found a true adage, and the gross carelessness of stockholders cannot be shielded by alleging the negligence of agents.

To award contracts for reducing ore to the lowest responsible bidder appears the simplest feasible course under the conditions then existing, but unfortunately for the mine stockholder this was rarely done. The number of mills had been steadily reduced since the end of the year 1863, but the capacity of the remainder had been so enlarged that competition was as sharp as ever, except during short periods of unusual productiveness. In order to obtain ore all agencies at the command of the competitors were brought to bear. Personal friendship with the mine superintendents, influence from any source with the controlling trustees, persuasion and secret underbidding were resorted to without stint. In their extremity, with certain loss and possible ruin staring them in the face, it is scarcely surprising that the means employed to influence superintendents or trustees were often questionable. It is certain that the custom of making presents to officials, or paying to them personally a percentage of the charges for reduction, had gained a dangerous foothold in the district,[1] and though it may be that the majority of awards were not influenced by pecuniary considerations, it is safe to say that personal favoritism weighed heavily in the balance. It was not usual to award contracts on the basis of comparative returns strictly, and this theoretically sound system was not, therefore, the one which was displaced by the organization of the Union Mill and Mining Company.

The power of this strong corporation was soon evident. Its stockholders were able to control the ore reduction of the most productive mines on the lode, as they were the principal owners in these mines. Their seven mills were kept busy day and night; others were soon acquired by purchase, and within two years from the formation of the corporation it was the owner of seventeen mills, which crushed the great majority of all ores reduced in the district.[1] If the Sutro tunnel should afford means of reducing ores on the Carson River more cheaply than the mills of this corporation could afford to reduce them, it was not surprising that the Union Mill and Mining Company should be opposed to the scheme, for success to Sutro might be disastrous to them. If they contended against the construction of the tunnel, therefore, as the owners of seventeen mills, it was a natural, if selfish, course, and few existing corporations would have the right probably to cast the first stone at them.

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[1] I. L. Requa, W. N. C. Maxwell, and others.

The construction of a railroad, connecting the Comstock Mines with the chain of mills acquired by the Union Mill and Mining Company, was a naturally suggested measure, and it was also another stumbling-block in the way of the tunnel project. Mr. Sutro looked upon it as a special device of the enemy for his discomfiture, but there is no reason to believe that a desire to foil his plans was its occasioning cause. Undoubtedly the stockholders of the Union Mill and Mining Company, or, as Mr. Sutro preferred to style them, the Bank of California, were not disposed to consider Mr. Sutro's personal interests or feelings, for the war of recrimination then carried on was frankly bitter; but the organization of the Virginia and Truckee Railroad Company was planned by a cool and calculating brain which has rarely, if ever, allowed personal animosities to interfere with business interests. The lumbering ore-carts, dragged by plodding files of mules on steep, muddy, and at times impassable roads, were a constant eye-sore to one who liked to see all the details of silver production carried on with the easy and harmonious movement of a grand machine. The blockade of a road by snow in winter, or by the mangling floods in spring, galled him; the stoppage of a mill for want of ore was a positive loss to him and a keen annoyance in consequence, for it troubled alike his plans and his pocket. Accordingly, the Union Mill and Mining Company had not been long in existence before its projector decided to complete the system by which he and his associates controlled the silver production of the Comstock Lode. His plans were not conceived without due forethought, but few knew of his design until it sprung in full armor from his brain.

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[1] I. L. Requa.

The scheme of a railroad or system of tramways connecting mines and mills was not, indeed, a novel one. It had been banded about like a shuttlecock since Paul, Harris & Coover had demonstrated the possibility of reducing the Comstock ores profitably in the immediate vicinity of the lode. The first Territorial Legislature, among the hundred bubbles which it blew, had created J. H. Todman and others a body corporate, by and under the name of the Virginia, Carson and Truckee Railroad Company, with authority to run lines like spider-legs north, south, and west from Gold Hill to Virginia City, Dayton, Carson City, and the Truckee River; but this liberal franchise proved useless to the grantees.[1] A later legislature, with even more extended and magnificent ideas, granted separate charters to three applicants, authorizing them to construct railways from the summit of the Sierras to Virginia City, with branch lines to all desired points;[2] but these charters, two of which were morally certain to conflict if utilized, expired like their predecessor. Shortly after Nevada became a State the dormant project was revived in a somewhat more practical form by charters granted to two associations, in spite of the veto of the governor, authorizing them to build a railroad to the Truckee and Carson rivers from Virginia City.[3] The probable continuance in depth of the lode had then been fairly established and the construction of such lines of communication reasonably justified. The depression of the mining industry at the time and the lack of the necessary financial backing and executive ability caused these roads to exist on paper merely. Unsuccessful efforts were made to dispose of one of these really valuable charters to English capitalists,[4] but no speculator could be persuaded to risk his fortune in the enterprise; and in spite of certain spasmodic throes the scheme remained a feebly-galvanized corpse until Mr. Sharon concluded to breathe the breath of life into the body. In December, 1868, he sent for Mr. I. E. James, the leading mine surveyor of the district, and said to him curtly, without any preface: "Can you run a road from Virginia City to the Carson River?" "Yes!" answered the surveyor with equal brevity. "Do it, then, at once!" said Mr. Sharon; and the surveyor began work immediately to carry out the direction without further instructions. This characteristic interview has an apochryphal flavor as thus related, but is unquestionably a fact. About occurrences on the Comstock Lode, if anywhere in the world, truth often appears stranger than fiction. Mr. Sharon knew his man, however. The work begun by Mr. James and his assistants was pushed with uncommon ability and energy. Mr. James was well acquainted with the ground to be traversed and his judgments were alike rapid and accurate. All trained engineers will understand the natural obstacles in the location of a road from a point in the heart of a mountain range 6,205 feet above sea-level to an objective point in a valley 1,575 feet below. A descent of nearly 1,600 feet must be made in a grade length of 13½ miles from the lode to the Carson River. Only personal inspection, however, will convey an adequate idea of this triumph of American engineering skill. The spanning of ravines and the opening of tunnels enter into almost all railway plans, but the eye which attains the best effect at the least cost is not always evident. The turns and twists and convolutions of this road are indescribable; it winds along like the trail of a serpent on a rock. The maximum grade is 116 feet to the mile, and the total curvature in the distance traversed is 17 × 360°; or, in other words, the aggregate curves of the road would make 17 full coils of the track in the space of 13½ miles.[1] This extraordinary feat of location was made in thirty days, and before the survey was finished the work of grading was begun. Mr. Sharon had meanwhile acquired the rights of holders under old franchises, obtained the pledged co-operation of wealthy associates, secured a charter for his proposed corporation from the sitting legislature as the Virginia and

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[1] Act approved November 29, 1861; Laws of the Territory of Nevada, Gillespie's Edition, chap. LI, p. 181.

[2] Acts approved December 19, 1862, incorporating the Lake Bigler and Virginia Railroad Company and the Virginia City and Silver City Railroad Company, chaps. LXVIII and LXXVIII; Act approved December 20, 1862, incorporating the Virginia and Truckee Railroad Company, chap. CXXVI, Laws of Nevada.

[3] Statutes of Nevada, 1864, 1865, pp. 180-183, 331; Acts incorporating the Virginia and Truckee Railroad Company, and granting J. W. Woodruff and others the right to build a railroad from Virginia City to the Carson River, passed March 2 and March 9, 1865, respectively.

[4] Territorial Enterprise, December 7, 1866.

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[1] Isaac E. James, Superintendent Sierra Nevada Mining Company.

Truckee Railroad Company, and the passage of acts authorizing commissioners to issue bonds of Ormsby and Storey Counties as a subscription in aid of the new road to the amount of $500,000.[1] This subscription was a simple gratuity, and was not unfrequently alluded to in later years—half facetiously, half regretfully—by citizens who saw the treasures of the mines flowing directly through their assistance into the coffers of the railroad company. In these comments Mr. Sharon figures as a financial agent almost as captivating as the harper Glenkindie in his demands upon the county treasuries. There was nothing in the gift itself to occasion either regret or suspicion. The direct and certain benefit to the industries of both counties, if the road was generously managed, might well have warranted the subsidy, if such grants are ever defensible, but a grave mistake was committed in not securing any pledged reduction of transportation rates or tariff of maximum charges. Perhaps the railroad company would not have accepted the gratuity if coupled with disagreeable conditions, but the experiment was at least worth trying. In the enthusiastic haste of the voters the importance of such a guarantee was unnoticed or ignored. Mr. Sharon knew how to take advantage of the temper of the people and to weld his iron at the right moment. The grant was made unconditionally, and Lyon County commissioners two weeks later were authorized to issue an additional $75,000,[2] coupled with a condition, however, which canceled the allowance after the road was completed as the company failed to comply with its specifications.[3] Not content with this large subsidy, the railroad company obtained a subscription of $700,000[4] from the mining companies on the lode in the form of loans and direct donations.[5] Thus the sum of $1,200,000 was raised in less than two months, through the financial ability of Mr. Sharon and his associates, and the construction of the road was definitely assured.

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[1] Virginia City Territorial Enterprise, April 9, 1869; Statutes of Nevada, 1869, pp. 43–49; Acts approved January 27 and February 21, 1869.

[2] Statutes of Nevada, 1869, p. 62, Act approved February 15, 1869.

[3] Territorial Enterprise, June 8, 1870; Decision of Supreme Court, State of Nevada, denying application for a peremptory writ constraining Commissioners to issue bonds.

[4] San Francisco Evening Bulletin, April 14, 1869.

[5] Virginia City Territorial Enterprise, February 16, 1875.

The energy with which the work of grading and equipping was pushed merits high praise. The road was a short one, its total length from Virginia City to Carson being only 21 miles, but its construction was one of the most signal achievements of American mining enterprise. Before the middle of April (1869) 750 men were at work along the line of the road,[1] and this number was increased during the month to 1,200, most of whom were Chinese.[2] Thirty-eight camps were established between Virginia City and Carson, and the obedient Chinese toiled like ants from morning to night, spurred on continually by urgent supervisors. Rails were ordered from England in January and shipped early in March, and by Mr. Sharon's forethought other cargoes were conditionally engaged in the event of loss by shipwreck.[3] Before the arrival of the English ships engines were built to order, ties were hewn, and the track made ready.

At 7.30 A. M., on September 28, 1869, H. M. Yerrington, superintendent of the road, drove a silver spike to secure the first rail laid at Carson City, and three hours later a locomotive was running on the newly-laid track.[4] In six weeks all the rails were laid, and in the early evening of the 12th of November, 1869, the first locomotive came puffing up the grade to Gold Hill, hailed by a deafening din of steam-whistles blown at the mine hoisting-works and by the hearty cheers of an enthusiastic crowd. The Gold Hill band played triumphant airs; flags waved from the trestle-work of the bridge spanning Crown Point Ravine and from all conspicuous points in the city. The mayor of Gold Hill and other town officers stood on the crest of the hill to welcome Mr. Sharon as he came toward them on the engine Lyon. Yet the reception was a suggestive contrast to the one accorded the first governor of the Territory eight years before. The flavor of pomposity and soaring pretension which characterized the early city had vanished. The swelling turkey-cock had become an unobtrusive fowl searching industriously for food. So the greeting was informal, when Mr. Sharon stepped down from the engine, and the crowd moved off without preface to an open space close by, where a variety of liquors was displayed. Mr. Sharon invited the company to drink, and when a few bottles had been opened by the dignitaries the thirsty crowd swooped down upon the feast like good-natured harpies, causing it to disappear in a moment. Then followed the inevitable speech-making by the host and others, from the only available rostrum, an empty engine-tender; all, however, short, simple, and to the point — model addresses apparently of their kind. The difficulties mastered by the designers and builders of the road were briefly recounted and the practical benefits of its construction clearly stated.[1] The speakers were frequently cheered, and when the meeting adjourned informally Mr. Sharon might have had any office in the gift of his hearers for the asking.

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[1] San Francisco Evening Bulletin, April 14, 1869.

[2] Territorial Enterprise, April 9, 1869.

[3] Territorial Enterprise, June 5, 1869.

[4] Gold Hill News, September 28, 1869.

This popularity was in a measure, at least, deserved, for notwithstanding the liberal allowances, aggregating about $1,200,000, the personal outlay of Mr. Sharon and his associates was very large. The cost of the road was $1,750,000, or $83,333 per mile, without reckoning the necessary equipment of rolling-stock, machine-shops, &c,[2] and when, during the following year, it was extended to Reno, a station on the line of the Central Pacific Railroad, this original outlay was more than doubled, though the expenses were provided for in part by the issue of bonds.[3] An apparently authorized statement made by the editor of the Territorial Enterprise, February 16, 1875, alleges that the owners of the road paid into its treasury the round sum of $1,500,000, in addition to the amount obtained from other sources.[4] If this assertion is correct, the risk of constructing the road was equally shared, even if its direct profits were not divided.

The benefits derived from its completion were unmistakable. Freight charges upon all kinds of goods were immediately reduced. The price of cord-wood delivered in Virginia City, a most important item, fell from $15 to $11.50, and contracts were offered for delivery in the spring of 1870 at $9 per cord.[5] Two dollars per ton[6] was charged for carrying ore from the mines to the Carson River Mills instead of $3.50 per ton, as previously, and the cost of transporting other articles was proportionally diminished. A natural result of this reduction was to bring into market a large amount of ore lying on the mine-dumps or still left in the lode as too poor to pay the charges for transportion and milling. The first ore shipped over the railroad was 7 car-loads, 60 tons in all, from the 700-foot level of the Yellow Jacket Mine, of a grade which had been considered too poor to reduce and had been used as waste rock to fill abandoned drifts.[1] Train after train, loaded like the first, ran down the steep grades and round the sharp curves to the Carson River Mills. The old quartz-wagon teamsters saw the novel spectacle with dismay. Their occupation was gone: "Sharon's iron mules," as they styled the untiring engines, dragged away their accustomed freight before their very eyes. Competition was useless, and the files of mules, with their creaking carts, soon disappeared from the roads. A few stubborn spirits made a determined struggle against the inevitable monopoly. Ten and twelve-horse teams hauled ponderous loads in wagons with "back-action" attachments, at imminent risk of accident, down the range to the valley. One load so dragged to a mill at Johntown weighed 73,050 pounds, and including the wagons 90,690 pounds,[2] while loads of 25 tons were not uncommon. The engineers on the railroad, however, laughed at their competitors, and rivaled one another in successive trials. The locomotive Nevada hauled 112 tons from the lower dump of the Yellow Jacket Mine over Gold Hill and down to the Carson River.[3] Six months later the engine Comstock hauled up the Crown Point Mine branch track 401,200 pounds gross,[4] and in May, 1871, the same engine dragged away 434,120 pounds.[5] Yet even this great load was surpassed, it is said, by the engine Carson in later trials.[6] This was too much for flesh and bone to match, and when one of the 14-horse teams ran off the Geiger grade, so-called, about five miles from Virginia, breaking up the wagons and badly injuring the horses, the contest was practically at an end.[7] The railroad soon held an uncontested monopoly of the freight business, and from 30 to 45 loaded trains were dragged daily over the road from Virginia to Carson City.[1]

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[1] Gold Hill News, November 13, 1869.

[2] The Big Bonanza, p. 228.

[3] The official statement of the road for the year 1880 shows an expenditure upon construction account of $3,715,378.23; for rolling-stock, $712,278.84; for real estate, $206,998.21; and for teams, $34,047.84; a total of $4,669,203.12. Annual Report of H. M. Yerrington, Vice-President and General Superintendent of Virginia and Truckee Railroad, to Secretary of State of Nevada.

[4] Territorial Enterprise, February 16, 1875.

[5] Gold Hill News, January 8, 1870.

[6] San Francisco Evening Bulletin, April 14, 1869; United States Geological Exploration of the Fortieth Parallel, vol. III, Mining Industry, p. 163.

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[1] Gold Hill News, November 19, 1869.

[2] *Ibid.*, April 7, 1870.

[3] *Ibid.*, November 3, 1870.

[4] *Ibid.*, March 10, 1871.

[5] *Ibid.*, May 24, 1871.

[6] *Ibid.*, June 1, 1871.

[7] *Ibid.*, May 20, 1870.

Ore-product, reduction, and freightage were thus mainly controlled by Mr. Sharon and his associates; but even these profitable monopolies were not sufficient for their wants. They saw no reason for conceding to others any profits which could be made to flow into their own coffers; or, perhaps, it might be said more justly that, after the main industries fell into their hands, it was a practical necessity to place them beyond the risk of hindrance or interference. To insure certain independence the wood and water supply must be controlled by members of their combination. As long as wood could be profitably cut in the ravines of Carson and Washoe valleys it was not practicable to monopolize the product; but when this woodland was stripped and it was necessary for the wood-choppers to ascend the upper slopes of the Sierras, an opportunity was offered to grasp the lion's share of the business. To transport the hewn logs in wood-carts to saw-mills in the valley of the Carson or to the line of the railroad was an expensive task. The construction and repair of mountain wood-roads became so costly that a cheaper method was urgently called for, and the need created its own supply, as an imperative demand has commonly done, in the Comstock mining district at least. In several places where the slope was steep short chutes of timber had been constructed, down which the logs slid headlong to the dumps, leaving behind them trails of fire and smoke. This was a swift method of freightage, but it could only be used to a limited extent. Where the declivity was slight the logs would not glide over dry timbers, and it was necessary to overcome this difficulty. This was done by utilizing the brooks which flowed down the mountain sides. In place of the dry trough or chute, timber conduits or flumes were constructed, extending many miles in winding lines among the hills, and filled by the influx of streams and water-ditches along their course.

The first wood flume in practical operation was probably the square box-flume, one mile in length, constructed by J. W. Haines during the month of August, 1866, in Kingsbury Cañon. This form was soon shown to be unsuited to the requirements of the work, and a V-flume was designed and constructed by Mr. Haines during the spring of the following year. To form this flume rough planks 1½ inches thick, 24 inches in breadth, and 16 feet long, were joined at an angle of 90°, and the trough thus made was lengthened by the junction of similar sections with overlapping ends. The flume was laid on the ground with simple wooden props, and supported by trestle-work when ravines were crossed. During the following year the sections were made to abut instead of lapping over, and no important change in plan has since been devised; though the flumes are now lined with boards to render them more durable, and the width of the side-planks has been increased to 30 and 32 inches. A. C. Cleveland and other builders soon adopted the model thus given and the success of the enterprise was assured. Saw-mills were erected at suitable points in the mountains, and timbers were then borne down to the valleys, like firewood, from the summit of the Sierras. At first the descent of the flume line was only 1½ inches to the rod, and in order to maintain this grade they wound about hills, skirted the edge of precipices, and crossed deep cañons on lofty trestles. Timbers and wood glided down the current, at short intervals, in a long procession, without crowding or jamming against one another, until they were thrown forth at length from the end of the flume upon a dump in the valley. But when reservoirs stored the mountain drainage and with creeks and lakes supplied strong flowing streams, then the grade of the flumes was raised in places to an elevation of four feet to the rod and the water fall was a sheet of foam. Massive timbers thirty-two feet long were hurled down these rapids like arrows from a bow, while the flume trembled with their motion and the water was banked up before them in white curling mounds like breaking surf. When a jam took place the heavy beams were shot against the block by the water catapult with a splintering crash, until the passage was cleared by workmen or a more powerful head of water swept away the obstacle with resistless pressure. Thousands of acres of woodland were thus utilized which could never have been reached by teams, and abundant supply of timber and fuel was assured.

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[1] The Big Bonanza, p. 228.

When the profits which could be derived from flume construction became evident, Mr. Haines applied for a patent upon his device, which was granted in1871. Then he began suits against alleged infringers. Among these were William Sharon and associates, who had not failed to recognize the merits of the invention if not of the designer. The suit of James W. Haines *vs.* William Sharon *et al.* was brought to trial August 7, 1872; but the plaintiff failed to recover damages, as his patent was adjudged to be invalid on the ground that the invention had been in common use for two years before an application for patent had been filed.[1] Thus the defendants were permitted to enjoy their flume privilege undisputed as well as their other sources of income. Unless water could be obtained, however, their wood supply was likely to be of little service.

During the years immediately following the discovery of the lode the growing towns on the slopes of Mount Davidson and Gold Hill procured an irregular but sufficient supply of water from the short tunnels which honeycombed the hillsides. If ledges were not cut, or were found to be barren, the tunnels were abandoned, but the work was not wholly fruitless. From the mouths of nearly all rivulets of water trickled, and from a few streams, which might be called brooks, flowed throughout the year. While the towns were merely straggling lines of cabins any one who chose might dip a pail into the streams, or drain off a portion of the water into troughs and shallow pits, for household use; but when the camps became municipalities, the rivulets began to have a recognized market value. Tunnel and mining companies, whose search for ore had been unrewarded, found an unlooked-for source of revenue in the barren rock. Water was as readily salable as ore, and the demand for it was imperative. The business houses and residences in the towns, the mills, and the mine hoisting-works needed a constantly increasing and certain supply, and were forced to pay a round sum for the quantity used. In some instances the engines at the mines raised all the water required for their boilers from their own shafts, but as this mine-water was generally impure and its use occasioned a rapid formation of scale, the mining companies preferred the water which flowed from tunnel levels nearer the surface.

To control the sale of this tunnel-water two corporations, the Virginia Water Company and the Gold Hill Water Company, were formed, and consolidated May 12, 1862, as the Virginia and Gold Hill Water Company, with an enlarged capital stock of $250,000, and the new company took measures at once to secure all the available water and provide for its distribution.[1] Before September, 1863, they had bought or leased the streams flowing from seven tunnels, the principal water sources, and conducted them through flumes and ditches into large cisterns, from which the water was distributed to all points in Virginia City and Gold Hill. The mains first laid were wooden boxes, roughly joined, and placed on or near the surface, with branch-pipes of lead tubing. In August, 1863, iron supply-pipes were laid in South C street, and were thenceforth substituted for wood to a considerable extent.[2] If the supply had been commensurate with the demand the profits of the company would have been extraordinary, but the amount obtainable was so scanty that it was necessary to dole it out at exorbitant rates.

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[1] Report of O. D. Wheeler, Special Agent Tenth Census, "Flumes and Fluming Operations in Western Nevada."

In October, 1863, only 56½ flowing inches of water could be obtained for the use of Virginia City, 48 of which came from the Santa Rita Tunnel alone,[3] and if the stream from the last-named tunnel decreased, as appeared probable, a water famine was imminent. Thus, while the mines were plagued by the influx of water, the miners were in danger of suffering from thirst, a situation best described by the paradox of Coleridge. Fortunately the supply was maintained with slight diminution until the melting of the winter snows refilled the springs. Every succeeding year, as the city grew, the peril of water-drought increased; every year the record was repeated—flumes and pipes running full in spring and half empty in autumn. The price to mills and other large consumers was fixed at $100 per flowing inch monthly, and families procured a scanty supply, as a favor, at an average cost of $1 per week, exclusive of the charge for introducing service-pipes.[4] Many householders, who were unwilling or unable to pay this tax, did not scruple to help themselves at will from the wooden conduits or flumes, and the Water Company was obliged to wink at this usage, as they could well afford to do, for their profits grew in spite of the leakage. Up to August, 1863, they had expended $105,000 in the purchase of water-rights and the construction of their supply-system. Several dividends of 2 and 2½ per cent. had been paid, in addition to a regular monthly allowance of $5 on every one of the 1,000 shares of stock.[1] The receipts of the company for the half year ending January 1, 1864, were $47,386 and their expenses $15,016, showing a balance of $32,370.[2] During the spring and early summer the receipts were much greater and the expenses considerably less, as throughout the winter the water in pipes and flumes was constantly freezing, and a large force of laborers was often employed in the work of keeping the cisterns full.[3] With succeeding years the profits increased, and every effort was made to obtain water from the hills about the city. The drainage was so complete that from the shorter tunnels the water ceased to flow except during the spring months, and only the longer and deeper tunnels afforded a permanent supply. The Santa Rita Tunnel was still the main reliance[4] until the Cole Tunnel, a prospecting adit cut from the base of Cedar Hill, reached the quartz seam from which the Santa Rita Company derived their water. As two laborers were picking at the face of the drift (January 7, 1867) the rock suddenly gave way and a fountain of water gushed out with such force that the men were driven back to the mouth of the tunnel.[5] The size of the stream decreased in a few weeks until only 135 inches of water flowed through the tunnel;[6] but this current was more valuable than an ordinary mine. The flow through the Santa Rita Tunnel ceased at once, and the Water Company removed their useless flume upon the adverse decision of a motion to enjoin the Cole Company from diverting their water. It was ruled that the tunnel of the Cole Company was a mining work, begun and prosecuted in good faith to cut a ledge with well-defined croppings located by the company. The incidental subdrainage of another tunnel was unavoidable, and the injury was not sufficient ground for the issuance of an injunction. Consequently the Virginia City Water Company was obliged to make a new bargain with the Cole Company to obtain the water, which was leased to them at $40 per inch monthly.[1] The supply was still far below the demand, and the Water Company were obliged to eke out their allowance to the towns by turning the water pumped up from the mine-shafts into their cisterns and flumes. This water was often unfit to drink, or to use in engine boilers even, owing to its impregnation with foreign substances, especially when it had been lying stagnant for years in the mine-levels; yet, in default of better, it was used as sparingly as possible. During the summer months of 1870 the water from the new shaft of the Ophir Mine furnished the main supply,[2] though the water-level in the flume was marked distinctly with blue lines, and the unfortunate people who drank it perforce were disgusted and sickened.[3] Owing to the arrangement of the flumes the water circulating through Gold Hill was almost precisely the same as that furnished to Virginia City; but each city was shrewdly encouraged to believe itself the favored one, and forgot its own disgust partially in viewing the supposed greater misery of its neighbor.[4] Pure water became so precious that the Cole Company refused to renew their lease when it expired in 1870, and proceeded to lay a second system of pipes and flumes side by side with those already in place.[5] The Virginia City Water Company had apparently foreseen this rivalry, for they indirectly urged on the excavation of another adit, the Nevada Tunnel, to pass directly below the tunnel of the Cole Company. This work was pushed night and day. The Cole Company tried to impede it by applying for an injunction to restrain the prosecution of the work and by sinking a shaft to intercept it; but the application was not granted, and the shaft was adroitly passed. Twenty feet below the level of their adit the Nevada Tunnel entered the barren quartz seam which had proved a bonanza to both the Santa Rita and Cole companies, and the latter company saw its water disappear just as its system of pipes was nearly completed (November 25, 1870).[6] The disgust of its stockholders was outspoken—their golden fountain had been carried off bodily, and their rich ledge had become hopelessly barren. Their attorneys at once filed a bill applying for a preliminary injunction restraining the continuance of the water diversion until the final hearing; and the order was issued by Judge Sawyer (February 13, 1871), as it appeared in evidence that the Nevada Tunnel was excavated to tap the natural reservoir of the Cole Company and not to develop any known ledge. Furthermore, as the Cole Company held the water by the additional security of a ledge location, antedating not only the location made by the Nevada Tunnel Company but that of the Santa Rita as well, their prior right to the water was established, and it was apparent that the stream had been wrongfully cut off and diverted.[1]

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[1] Gold Hill News, March 2, 1865.

[2] Territorial Enterprise, August 26, 1863.

[3] Territorial Enterprise, October 27, 1863.

[4] Gold Hill News, March 2, 1865.

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[1] Territorial Enterprise, August 26, 1863.

[2] Sacramento Union, February 1, 1864.

[3] Gold Hill News, March 2, 1865.

[4] Virginia City Union, November 24, 1866.

[5] Gold Hill News, January 9, 1867.

[6] Territorial Enterprise, February 17, 1869.

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[1] J. B. Overton, Superintendent Virginia City and Gold Hill Water Company. Price formerly paid to Santa Rita Tunnel Company; Virginia City Union, November 24, 1866.

[2] J. B. Overton.

[3] Gold Hill News, October 25, 1870.

[4] J. B. Overton.

[5] Territorial Enterprise, November 27, 1870.

[6] *Ibid.*, November 26, 1870.

The Virginia City Water Company, after a futile attempt to obtain a dissolution of this injunction from Justice Field,[2] were content to see the Nevada Tunnel effectually bulkheaded and the water flowing from the Cole Tunnel as before. This water was the purest; but as the older water company supplied exclusively the mills on Gold Cañon, their revenue was the largest, amounting to about $10,000 monthly, while the Cole Company received an income of from $5,000 to $6,000 during the same time.[3] The people had no more water than before, and its cost was no less, but the monopoly of water supply was at an end. Thus the result of the water war was satisfactory to citizens, who dreaded lest food, water, wood, ore, and all supplies should be controlled by the Briareus, whose arms were extended over the district; for Mr. Sharon and his friends were the principal stockholders in the Virginia City Water Company and could at any time dispose of the water as they saw fit. Still, their apportionment of it was equitable enough, and if the supply-rate was high it was not exorbitant, if the scantiness of the flow and the urgent demand for milling purposes are considered.

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[1] United States Court Reports, Ninth Circuit, Sawyer, vol. I, pp. 470–484.

[2] *Ibid.*, pp. 685–696.

[3] J. B. Overton, Superintendent Virginia and Gold Hill Water Company.

CHAPTER XIV.

A HAZARDOUS TASK.

These various enterprises proved true bonanzas, but when the principal ones were undertaken their issue was by no means certain. The first cost of the mills and the railroad was very considerable, and it was a question of moment whether the prospective profits would defray the expense of construction, equipment, and maintenance with interest. Large profits were assured if sufficient freight and ore could be obtained. Freight business could be had if the mines remained productive. On this last point hinged the success of all other enterprises. When the road was built, the outlook appeared gloomy to many. The output of the mines decreased in 1869 to a little more than half the product of 1867,[1] and signs of a further diminution were not wanting. In 1869 many practical miners on the lode feared that the ore-deposits would be fewer and poorer as the depth of the mine-workings increased. Records and experience in all parts of the world were held to establish the fact that the richest ores were commonly found at no great distance below the surface, within a range of a few hundred feet usually. In other mines, moreover, ore-deposits existed frequently as a continuous sheet or vein, broken or faulted by natural forces, perhaps, but still traceable with skill and perseverance; but in the Comstock Lode the ore-bodies did not exist in any form resembling a continuous sheet, except in the surface workings on Gold Hill. They were misshapen, dislocated bodies, scattered irregularly through the lode, resembling nothing so much, to borrow the vivid simile of a now famous miner, as raisins in a pudding or duff.[2]

In 1869 all the known bonanzas were nearly exhausted, and the search for others through the heart of the lode had not been well rewarded. The

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[1] Value of Bullion product, 1867, $13,738,618; 1869, $7,528,618; Report of United States Commissioner of Mines and Mining, 1869, p. 113.

[2] John W. Mackey.

Ophir deposit had failed long since; the Gould & Curry body was nearly exhausted;[1] the Yellow Jacket Mine product had fallen from $2,677,448 in 1867 to $682,004 in 1868; the Empire Mine had paid no dividends since 1867 and the Imperial Mine paid only $24,000 in 1869, yet these two mines embraced the richest section of the Comstock Lode at Gold Hill in early years. Of the productive mines developed later all showed a falling off in 1868 except the Savage and Overman. The ore of the Overman Mine was of so low a grade, milling only $17 per ton, that its value to the mine owners was inconsiderable, and the exhaustion of the Savage Mine bonanza must have been foreseen, as the dividends declared the following year, 1869, only amounted to $90,000, as contrasted with $1,560,000 paid to stockholders in 1868. Explorations in depth had not been pushed far, it is true, but the indications revealed were certainly not promising; the gangue appeared to be changing from predominant quartz to predominant carbonate and sulphate of lime, a deposit which had been hitherto comparatively barren,[2] and ore-bodies occurred less frequently and were of less extent, while the ores were becoming poorer and more refractory than in the superficial bodies. Of the eleven ore-bodies known to exist at the beginning of the year 1868, the greater number were completely or nearly exhausted, and no new development of importance had been made during the year.[3] These facts were well known to all careful observers in January, 1869, and the prospect was naturally gloomy. The single ray of light apparent was the discovery of a small vein of extremely rich ore on the 900-foot level of the Yellow Jacket Mine in the previous November.[4] This was the first considerable deposit of rich ore which had been found up to that time at so great a depth, and its value as a sign and beacon was evident. Whether this discovery was the immediate cause of Mr. Sharon's decision to form the Virginia and Truckee Railroad Company is not known, but that it influenced his action is at least probable, for no change of importance on or in the lode at that time escaped his notice.

What is termed luck is commonly the result of swift comprehension and firm grasp of opportunities. The organization of the Union Mill and Mining Company and the building of the Virginia and Truckee Railroad were, without doubt, measures of a clear-sighted financial policy. That both proved eminently profitable investments from the outset is true, but it should be remembered that the Union Mill and Mining Company was organized at a time when mill property in the district was a drug in the market and that the railroad was built when the prospects of the lode were darkest. Whatever may be alleged with truth against the men who then controlled the product of the Comstock Mines, their ability to form great conceptions and execute them with signal vigor cannot be denied. It may be true in a sense that they held the lode in their grasp, but it proved impossible for them to prevent others from making fortunes in the mines, even if this was their wish. What they did for the Comstock Lode is matter of history; they lifted the Washoe Mining District out of a slough of despond; they pierced the belt of barren quartz; they raised new treasures to light, and made the tottering cities of Washoe again stand firm. Others aided them in this work and deserve to share the credit justly due; others possibly might have done what they did if left without help, but that is uncertain and irrelevant. It is for achievements and not for possibilities that this world is in debt. The bones of mute Miltons and guiltless Cromwells rot justly in unmarked heaps. No credit should be given, moreover, which is not justly due. The benefit to the people of Washoe and to the silver mining industry of the world was inevitable rather than intentional, for those who developed the lode did so from motives of self-interest as a profitable speculation.[1] Philanthropic considerations did not enter into their plans, and they have claimed no acknowledgment on this score; yet like most great business enterprises their schemes proved of more real service to the working people of the district than a hundred professed charities. Capital was expended intelligently, efficiently, and lavishly wherever needed, and was not wasted through the lack of co-operation or supplied in driblets.

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[1] Product in 1868 only 13,835 tons of low-grade ore. No dividends declared.
Report of United States Commissioner of Mines, 1868, pp. 92–97.

[3] *Ibid.*, p. 97.

[4] Territorial Enterprise, November 25, 1868.

Even if the rate of wages had been unchanged, the miners would have profited largely by the increased certainty and duration of their employment; but these conditions made it possible for the men whose league had been practically dissolved in the spring of 1865 to unite again with some reasonable hope of maintaining persistently an artificial standard of wages. They were quick to perceive the opportunity offered in the increased productiveness of the district during the year 1866 and the consequent encouragement given to investors, and the Virginia City Miners' Union was organized on the 4th of July, 1867, only two months after the incorporation of its main ally and support, the Union Milling and Mining Company. It is certain that the latter union was not formed with any view of benefiting the day laborers of the Washoe District, but it is equally certain that the existence of the Miners' Union depended upon the maintenance of an organization which assured a steadily progressive development of the lode. If the Union Milling and Mining Company and the Virginia and Truckee Railroad Company had not been formed, it is most probable that the union of miners would have melted away in 1870, as the league, its predecessor, had dissolved in 1865, and so, if the miners had been clear-sighted, they would have welcomed a dreaded combination, as in truth a champion even if *malgre lui*. In the constitution of the union their main end in view is, perhaps discreetly, veiled in vague phrases:[1] "the object of this union," it is written, "shall be the practice of those virtues which elevate and adorn society and remind man of his duty to his fellow-man; the elevation of the position, and maintenance of the rights of the miner." Provision was made for the care of members during temporary illness by an allowance which in no case could exceed $80 annually to one person,[2] and an appropriation of $80 was made to defray the funeral expenses of a deceased member.[3] These articles were, however, of insignificant importance compared with a resolution which does not appear in preamble, constitution, by-laws, or any published manifesto, but which is the very keystone of the union, constraining, as it does, the mining companies of the district to pay every person employed in underground labor of any kind at the rate of $4 for eight hours' work, to which a shift, so called, was usually limited.

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[1] William Sharon, 1880.

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[1] Constitution and By-laws of the Miners' Union of Virginia, Nevada, Article I, Section 3.

[2] *Ibid.*, Article IX, Section 6.

[3] *Ibid.*, Article X, Section 2.

The combination of miners was so complete and well-timed that the mine managers realized the impossibility of making head against it, and were obliged to accept the terms which it dictated. One powerful company alone held out for a month, and the means which were adopted to break down its opposition were simply effective. On the night of August 4, 1867, a meeting of the union was held, and the case of the stubborn offender, the Savage Mining Company, was gravely considered. Those unacquainted with union methods might naturally have been surprised to note that the only resolution taken was one instructing the officers of the union to appoint a committee to visit the mine and request that all underground laborers should be paid at the rate of $4 per day.[1] Their surprise would have been modified on the following day, when it was seen that the "committee" consisted of 300 men, who quietly formed in column and marched to the Savage mine works,[2] where the foreman, after a short parley, was persuaded to hoist out the working miners in order that it might be ascertained how many were receiving less than $4 per day. Fourteen of the seventy miners thus brought to the surface admitted that their wages were less than the union standard and were ordered to stand aside as black sheep. At this moment the superintendent, Charles Bonner, reached the works and explained to the committee that he paid four dollars per day to all working at the breast, but to shovelers, pick-carriers, and laborers of their class, he considered that it was fair to pay less. He failed to convince his hearers, but the most gifted pleader who has ever lived would have been equally unsuccessful. The committee were deaf to any remonstrance, and when the superintendent ceased speaking all the members of the League cried out: "Four dollars per day to all men working underground, no matter what the work!" To resist this demand was impossible. A few of the underpaid men were allowed to complete their day's work; but when the union met in their hall, upon the return of the committee, it was finally resolved that the rate of wages as proclaimed that day should be enforced throughout the district.[3] The Savage Mining Company bowed to the decision, and thus the arbitrary standard of wages became again a binding law on the Comstock Lode. By the force of this and supplementary enactments the unions on the Comstock Lode have controlled the wages fund with an iron hand up to the present time. Their will has been a recognized law which has overridden the natural adjustment of rates, and no open revolt against their despotic rule has ever taken place for the sufficient reason that no mine superintendent has been willing to risk his life in asserting his independence. It cannot be positively known, therefore, to what lengths the unions would go in defense of their position, but it is certain that the most venturesome mine manager has not yet dared to test their temper. The working body of miners are so quiet and orderly when their fancied rights are not in danger that it is difficult for a casual observer to realize how quickly their passions would be fanned to flame by an attack upon their cherished privileges. For fourteen years they have been allowed to distribute the wages fund of the mining companies with indiscriminating hands. The novice is paid as much as the experienced miner; yet, curiously enough, this apparent injustice is borne without protest, or is suffered as an inevitable evil attaching to an otherwise desirable system. If the existence of miners' unions is in reality an injury to the interests of the skilled miners of the lode, it is a self-inflicted one. The combination of employers rendered the combination of employés possible, but did not instigate it, and to hold the former responsible for the acts of the latter would be as absurd as to indict a cordage maker for selling a rope to a customer who converts it into a noose with which he hangs himself. If the wages fund was misused by the Miners' Union, they were nevertheless indebted to the men who placed it in their hands.

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[1] Territorial Enterprise, August 6, 1867.

[2] Gold Hill News, August 5, 1867.

[3] Territorial Enterprise, August 6, 1867.

The small capitalists of California and Nevada alone may have had cause to regret the combination which monopolized the lion's share of the profits yielded by the productive mines. From lack of organization and money they could not compete to advantage in mining or milling with their great rival. If they were forced to abandon the unequal contest they deserve no particular commiseration, seeing that the control of all great enterprises has fallen into the hands of the few from time immemorial. This may not be an ideal ownership and management, but it is clearly lawful, and those who object to it must supplant it, if at all, by a broader and abler union.

When the impending barrenness of the lode, the general depression of business, and the extraordinary cost of labor under the ruling of the Miners' Union are considered, it is evident that the Bank of California had assumed no light responsibility in undertaking to support the mining industry of the Washoe District, and the burden upon its shoulders was made still more heavy by a terrible calamity which crushed lower the sinking fortunes of the lode and made many homes desolate.

Underground fires, the occurrence most dreaded by miners, had broken out in previous years, but had been extinguished without loss of life. Thus, in March, 1866, a fire kindled by some unknown chance in the 260-foot level of the Empire Mine (March 10), had spread with such swiftness that the men at work in this and neighboring mines were driven to the surface by outpouring volumes of smoke and gas.[1] Powerful engines threw streams of water constantly down the shaft, but the climbing flames reached the surface, burning through the planks and earth with which the shaft-mouth was closed. For hours the shaft was a reeking pit, but the fire died out finally, two days later, for want of fuel to feed upon, hemmed in, as it was, by bulkheads across all connecting galleries. Seven months later another fire was discovered in an upper level of the Ophir Mine, alarming the miners by the dense smoke which poured forth, but soon extinguished by their prompt action.[2] Thus in April, 1869, when the warning cry of fire was heard in the Crown Point Mine, the horrors which might ensue from its outbreak were but faintly realized. The fire originated in the 800-foot level of the Yellow Jacket Mine, about 135 feet north of its southern boundary line, on the morning of the 7th of April.[3] How it was kindled is unknown, but it is generally believed that a lighted candle was carelessly left in the drift so near the timbers that the dry wood caught fire. For some time the flames crept along the gallery unnoticed until the charred timbers broke beneath the weight of the crumbling roof. Then the unsupported rock fell with a crash, choking up the gallery and expelling a blast of foul air and smoke through connecting drifts into the shafts of the Crown Point and Yellow Jacket mines.[1] It was the hour when the shifts were changing, so that fewer men were at work in the mines than usual,[2] and this chance saved many lives. John Murphy, station-man at the 800-foot level of the Yellow Jacket shaft, heard a sound like a gust of wind roaring through the drift, and saw the fifteen lights in the station at once extinguished. The foul blast stifled him, and he crouched on the floor, wrapping his rubber coat about his face. In a moment he lost consciousness, but could remember when rescued that he heard a pitiful cry come up the shaft from a lower level: "Murphy, send me a cage; I am suffocating to death!"[3] Two miners at work in the 800-foot level of the Kentuck heard a like gale roaring through the drift and were instantly overwhelmed by its fierce blast of smoke and gas. One struggled through the stifling atmosphere to the Crown Point shaft and was saved; the other fell dying in the drift beyond hope of rescue.[4]

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[1] Gold Hill News, March 12, 1866.

[2] Territorial Enterprise, October 24, 1866.

[3] San Francisco Evening Bulletin, April 13, 1869.

It was in the Crown Point Mine, however, that this gust was most deadly. Forty-five men had just been lowered into the mine, getting off the cage upon different levels, and the cage was again descending with its load of men, when it plunged into a rising current of foul air at the 700-foot level; still it went down steadily to the 800-foot level, where men were found crying for help in the dark, amid a stifling smoke. The terrified sufferers rushed toward the cage as a last hope, and crowded in and upon it till not a bar was left to cling to. All could not be saved, and those who saw the cage rise toward the surface from the station knew that they were left behind to die.[5] As soon as the rescued miners could leave the cage at the surface it was lowered again empty to the 800-foot station, and after a moment's pause the signal was given to hoist and the cage was once more pulled up at full speed. Then was seen a ghastly and pitiful sight. Three brothers, from Yorkshire, England, all strong young men, were working in the Crown Point Mine. George Bickle, one of the three, stood on the cage insensible, leaning over his dead brother, Richard, and holding him with a grip which could scarcely be loosened. Richard Bickle had sunk down upon the bottom of the cage as it was drawn up, and his head and arm were torn almost completely from his body by the side timbers of the shaft. The dead and dying brothers were parted by kind hands, and George Bickle was laid tenderly upon a rude couch in the hoisting-works by the side of other sufferers, who, like him, were past all help of medicine. They gasped faintly for some hours and then their troubled breathing ceased forever.[1] The cage was lowered again to the lower levels of the mine, but no answering signal was given.

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[1] Gold Hill News, April 26, 1869.

[2] *Ibid.*, April 7, 1869.

[3] Testimony of John Murphy, before coroner, at inquest; Gold Hill News, April 26, 1869.

[4] Testimony of B. F. Rogers, at coroner's inquest; Gold Hill News, April 26, 1869.

[5] San Francisco Evening Bulletin, April 9, 1869; The Big Bonanza, p. 180.

Dense volumes of black smoke began to rise up the Kentuck, Crown Point, and Yellow Jacket mine shafts; steam-whistles sounded an alarm, and fire-engines from Gold Hill and Virginia City came rattling up to the burning mines. With the firemen came also a great company of men, women, and children, who crowded about the smoky works, pressing in at every opportunity, and trying to peer into the blackness of the pits where fathers, sons, and husbands were imprisoned.[2] Father Manogue and other humane Catholic priests moved about among the people, consoling them with the hopes of a possible rescue, and bidding them trust in God, the strongest shield and deliverer.[3] There were no wild cries or despairing shrieks.[4] The children could not understand the peril, and the hearts of brave women break silently. The weaker minds were stunned by the sudden horror of the scene, and many women stood staring vacantly, with clenched hands and swaying bodies, while they waited untiringly through the long day for news of their loved ones.[5]

Meanwhile, all possible efforts were made by superintendents and miners to rescue the doomed men. As soon as the smoke cleared away somewhat from the Yellow Jacket shaft, owing to a strong draft which began to set down that mine and up the Crown Point shaft, small parties of miners and firemen went down repeatedly into the burning pit, but at first without success. At 10 o'clock, however, two dead bodies were taken out of the Kentuck shaft, from the 700-foot station, and about noon four more were found and brought to the surface from the 900-foot level of the Yellow Jacket. No one could live for a moment in the reeking chimney formed by the Crown Point shaft, but as the blower of the mine was kept constantly at work puffing fresh air into the lower levels, it was faintly hoped that some in the depths of the mine, below the smoke-current, might still be living. A cage was accordingly sent down to the 1,000-foot level about noon, with a lighted lantern upon it and a sheet of pasteboard, upon which was written:

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[1] Gold Hill News, April 7, 8, 1869.

[2] San Francisco Evening Bulletin, April 9, 1869. Virginia City Territorial Enterprise, April 8, 1869.

[3] The Big Bonanza, p. 178.

[4] Territorial Enterprise, April 8, 1869.

[5] The Big Bonanza, p. 178.

> "We are fast subduing the fire. It is death to attempt to come up from where you are. We shall get you out soon. The gas in the shaft is terrible and produces sure and speedy death. Write a word to us and send it up on the cage, and let us know where you are."

When the cage reached its destined station there was a pause for a few moments, while all waited breathlessly for an answering signal. The hope was vain. When the cage was drawn up to the surface it was seen that the light was extinguished; but even if the writing had been illuminated by the beams of a cloudless sun instead of the dim rays of a glimmering lantern no eye within that dreadful tomb could have read the message. The roll of the three mines was then called. Of the men in the Crown Point Mine 23 were missing, in the Yellow Jacket 1, and in the Kentuck 4. Six bodies had been recovered; thus 34 miners, in all probability, were dead.[1] About midnight it was decided to attempt to descend through the 900-foot level of the Yellow Jacket Mine into the lower levels of the Crown Point. The days of chivalry are doubtless past, yet to penetrate into the depths of a burning mine and brave the imminent perils of suffocation by smoke and gas, on a forlorn hope at best, is a deed which few knights of old would have sought to match. Three Gold Hill firemen, Putnam, Lee, and Mercer, proved themselves worthy of the names they bore by facing the perils of the venture first, in company with a Virginia City fireman, Henry Aine. They reached the 1,000-foot level of the Crown Point Mine alive, groping their way with dimly-burning lanterns through the utter darkness and choking atmosphere of the drifts. Here the sights which they saw were graven in their memory forever. Dead men were lying on the floor of the level as they fell in the agony of suffocation, with their mouths glued to cracks in the planks or raised over winzes, turning everywhere for one last breath of fresh air. Their faces were flushed and swollen, but the features of well-known friends were not past recognition. Farther on, however, in the well at the bottom of the shaft, frightfully mangled bodies were found of wretched men who had met an instant death in their wild instinct to escape from torture. One poor sufferer had climbed up the shaft to a point between the 800 and 900-foot levels, where he was found hanging to the ladder with one leg fast inside, and still clasping the rounds with so firm a death-grip that he could only be plucked away by force. The bodies were tied securely to planks and hoisted, one after another, to the surface, where they were taken up in the stout arms of miners and firemen and borne away. All night long the crowd of relatives and friends had stood about the hoisting-works. Ropes were stretched to prevent their flocking in and impeding the very work of rescue which they longed to hasten. As the bodies were at last carried out a pitiful cry of women was heard. "My God! who is it this time?" was sobbed out often. Some of the bodies taken out last were so mangled or decomposed by the heat that it was thought most merciful to hide their faces from their wives and children. One poor woman begged hard to see the hair of her husband when friends refused to show her his face; as she touched his hair with a brief word of farewell a little girl whom she held by the hand cried, appealingly, "Can't I see my papa?" and the mother fainted.[1] But the prolonged agony of that night is not to be described. The bodies of the dead men were borne to their graves by the largest and most solemn funeral procession which had ever been seen on the eastern slope of the Sierra Nevada. Guards from Virginia City and Gold Hill, with reversed arms, and bands playing requiem marches, paid the last honors to the dead, and the long line of bearers was followed by the Miners' Unions and the Canadian Society, after whom moved the sorrowful company of relatives and friends.[1]

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[1] Gold Hill News, April 7, 1869.

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[1] Gold Hill News, April 8, 1869; The Big Bonanza, pp. 179-182.

Meanwhile the miners and firemen were battling valiantly with the unsubdued fire in the mines. As they made their way farther and farther into the burning drifts the danger grew more deadly. As fast as the flames were extinguished by the firemen the miners cleared away the charred wood and fallen rock and set new timbers in place. Streams of water were kept constantly playing on the heated rock of the walls to cool the smoky ovens which had been mine-galleries. Hot water stood ankle-deep on the floor of the levels, and its rising steam mingled with the sulphurous vapors of the decomposed ores and the smoke of the burning wood. A cave might occur at any time which would block the men up in a stifling prison, or expel a blast of foul air which would smother them in a moment.[2] In placing hose-pipes on the 700 and-800-foot levels of the Kentuck Mine miners fell repeatedly on the floor of the drifts insensible, and were carried fainting to the surface, where some lay gasping like dying men and others reeled and talked like drunkards. On regaining consciousness they described their first sensation upon breathing the gas as "a pain near the liver;" next they were conscious of an oppression in the chest and a gradual filling of the lungs with some inert foreign fluid; then followed dizziness and sudden insensibility.[3] Fresh air was pumped into the drifts by blowers through long-jointed pipes, but the relief thus afforded was only partial and might be instantly cut off. Then, too, when air entered the drifts the smoldering wood was fanned to flame and new heads of the hydra fire appeared about the men who had destroyed the monster, as they thought. The glare of the flames, the smoking, steaming drift, the rushes of the dripping firemen and the half-naked miners, working like Titans, with picks, shovels, and axes, to hold the ground when won, were a sight to stir the blood of any witness. In his ears, too, were the sounds of sharply-spoken orders, of brief words of cheer, of crackling wood, and rumbling ground overhead. Surely a hand-to-hand fight with fire in a mine is a gallant and fearful contest; yet it was a vain struggle, and was only prolonged because no one would advocate the fatal measure of closing the mouths of the shafts and filling the mines with steam while even the faintest hope remained of rescuing the imprisoned miners. This was done, however, at noon on the 9th of April,[1] and for seventy-two hours steam was forced from the boilers of the hoisting-works into the mines. At 12 M. on the 12th of April a stream of water was thrown down the Crown Point shaft in order to purify the air as much as possible; and after several attempts to descend in the cage small parties of miners succeeded in exploring several levels and in bringing up the bodies of three more victims; but it was found that the smoldering fire burst out again when fresh air was let into the mine, so that shortly before 11 o'clock in the evening of the 12th all the shafts were again closed tightly, after a final attempt of the Crown Point Mine superintendent to divert the steam current into the 700-foot level.[2] The pipe-connection was made, and it was only necessary to cut off the passage of the steam into the lower levels by driving a sheet-iron plate through the main conduit-tube. Mr. Jones and a young miner named Nagle worked for fifteen minutes to close the conduit in an atmosphere so foul that a bunch of nine lighted candles gave scarcely the usual light of one. Nagle was soon dazed and breathing painfully, but the superintendent, a man of unusual chest compass, suffered little, though he was conscious of an increasing intoxication. The blows of his sledge-hammer fell wide of the mark, striking the plate unevenly; yet he was so expert a miner that he could ordinarily cleave a fly on the wall with his pick. Still the work was nearly completed when the faint flame went out, leaving the workmen in total darkness. Nagle, half delirious, jumped upon the cage at the instant, and the superintendent had scarcely time to follow before the unnerved miner jerked the bell-rope violently, and the cage was dragged up through the warped timbers of the shaft at a rate of speed which terrified the men upon it, who expected to hear the strained cable snap momently. Half way up Nagle fell fainting against his companion, who held him tightly until the shaft mouth was reached, when he dropped the insensible body on the floor and staggered out of the cage, drunk as never before, nor since.[1]

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[1] Gold Hill News, April 8, 1869.

[2] The Big Bonanza, p. 180.

[3] San Francisco Evening Bulletin, April 13, 1869.

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[1] Gold Hill News, April 9, 1869.

[2] *Ibid.*, April 10, 12, 13, 1869.

Upon the failure of this desperate attempt to extinguish the rekindling flames steam was again injected continuously until the afternoon of the 14th of April,[2] and three days later the Yellow Jacket Mine shaft was reopened and efforts were made to ascertain and repair damages.[3] During the days immediately following all passages connecting with the Crown Point and Kentuck mines were carefully closed by bulkheads, so that, although the air continued bad in several levels for more than a month, work could be resumed with a portion of the former force.[4] On April 28th ore was hoisted from the upper levels of the Kentuck Mine, after an interval of three weeks;[5] but on May 3d it was found necessary to close both the Kentuck and Crown Point shafts, as the fire between the 700 and 600-foot levels appeared to be gaining.[6] For two weeks these shafts were closed, and when reopened, May 18, 1869,[7] work could be resumed by degrees, as the miners were enabled to hem in the unextinguished fire closely with bulkheads.[8] Even six months later men working in the upper levels of the mines would occasionally drive their picks into a recess where brands were still smoldering;[9] and once several miners were asphyxiated by a sudden influx of gas while extracting ore in a stope between the 600 and 700-foot levels; but they were taken out of the mine by fellow-workmen on other levels, and all recovered in a few hours.[10]

The stubborn hold which fire keeps in the exhumed chambers of ore, filled with masses of timber and waste rock, makes it formidable for months after it is apparently extinguished, for the unseen flames may burn fiercely at any moment; and unless constant watch is kept the miners are never safe while at work under-ground. The damage caused by the great fire was never fully repaired; some of the closed galleries were never reopened, and the bodies of these miners, if not consumed in the furnace which was kindled below them, remain at this day in the crypts where the men were entombed by the fallen roofs of the galleries. It was clearly demonstrated in this conflagration that steam is ineffectual to extinguish a mine fire, though of service in purifying the atmosphere and temporarily checking the flames so that the miners may erect substantial bulkheads at the desired points.

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[1] John P. Jones, Superintendent of the Crown Point Mining Company, 1869.

[2] Gold Hill News, April 15, 1869.

[3] Gold Hill News, April 19, 1869.

[4] *Ibid.*, April 19, 20, 22, 23, 24, 26, 1869.

[5] *Ibid.*, April 29, 1869.

[6] *Ibid.*, May 3, 1869.

[7] *Ibid.*, May 19, 1869.

[8] *Ibid.*, May 20, 21, 22, 24, 26, 1869.

[9] *Ibid.*, November 22, 1869.

[10] *Ibid.*, December 15, 1869.

CHAPTER XV.

A FORTUNATE DELIVERANCE.

In view of the failure of the known bonanzas, the combination of the miners to maintain high rates of labor, the scarcity of water, and incidental discouragements such as the great mine fire just described, the venture of the Bank of California must be accounted a hazardous one; though its hands were stayed in the task of upholding the sinking interests of the Comstock Mines by the two corporations, its children. To advance money or permit overdrafts for the purpose of prospecting silver mines is opposed to ordinary notions of bank policy, unless the security is ample. As the Comstock Mine owners were not held personally liable for the debts of their respective companies, the only security for loans was mine or mill plant, if ore was not discovered, in which event both mine and mill plant were practically worthless. Large advances were simply gambling ventures, as the bank directors well knew; so that when they suffered their bank to become a mine-supply company they were more liberal to the needs of the Comstock Lode than conservative of their own interests as bank stockholders, for the chances of loss thereby incurred were alarming. In the year 1743 a proposal was made to the royal and supreme council of the Indies that a mine-supply company should be organized, with a capital of $2,000,000, to aid in the development of the mines of New Spain.[1] The royal viceroy, Count Fuenclara, appointed two commissioners of approved experience and competence, both citizens of Mexico, to investigate the desirability of such an establishment. In 1745 these commissioners reported strongly against the scheme as impracticable on various grounds, but chiefly on account of the hazardous character of the investments. Though mine suppliers themselves, yet they accepted less than one out of a hundred of the mines offered to them, "not from the want of enterprise," as they said, "but from the experience we have so dearly purchased in this hazardous pursuit. Out of 100 ships the average loss, even during time of war, is but 8; out of 100 mines the average number of failures is 99." If this could be said truthfully of the rich mines of Mexico it could be asserted with emphasis of the mines of Nevada; not one claim in a hundred of those located within the limits of that State has been worth prospecting, and not one in twenty so-called "promising claims" has made good its promise. In the liberal but venturesome course followed by the Bank of California there was, moreover, an insidious danger. When large advances had been made without returns, the bank was obliged to face the probability of losing all its venture or lend an additional sum. A bold speculator will choose the latter alternative usually, and in this way his fortune may be irretrievably involved. Banks are not always more prudent than individuals. Mr. Sharon has said that the amount invested by the Bank of California at one time in the mines, mills, and towns directly dependent upon the continued productiveness of the Comstock Lode was $3,000,000.[1] The whole capital of the bank in 1870 was $5,000,000, and, though the great moneyed institution of the Pacific Coast, the loss of this investment, or even a popular dread of such a calamity, would have endangered its very existence, and certainly have crippled it for a time. Only the few directly acquainted with the condition of the bank will ever realize the anxieties which beset its management at the close of the year 1870. A number of the mines on the lode were indeed producing considerable quantities of low-grade ore, but few were paying dividends. The Savage Mining Company had paid its last dividend in June, 1879, the Kentuck in March, 1870, and the Gould & Curry a spasmodic and speculative return of $48,000 in

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[1] Gamboa's Commentaries, Heathfield's Translation, vol. 1, pp. 203-209.

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[1] William Sharon, 1880.

October, 1870, after three years of disappointment. The approaching exhaustion of the Hale & Norcross and the Yellow Jacket ore-bodies must have been foreseen, as both companies ceased the payment of dividends before the autumn of the following year (in April, 1871, and August, 1871, respectively). The Chollar-Potosi alone had a rich undeveloped ore-body in sight, which yielded a profit of $1,946,637 in dividends to the stockholders during the year ending May 31, 1871; but later developments were by no means in accord with the flattering prospects in the spring of 1871. No mines on the lode except those named had paid a dividend since the organization of the Virginia and Truckee Railroad Company in the winter of 1868. It was a dismal outlook, therefore, for the bank stockholders, when a chance discovery of rich ore in an unpromising section of the lode lifted them out of all their difficulties. The Crown Point Mining Company held this section, 540 feet in length; but it had paid no dividends since the outbreak of the fire in April, 1869, and the small amount of ore (5,680 tons) discovered in its lowest productive level had been completely extracted in March of the same year.[1] During the fiscal year ending May 1, 1870, $240,000 were levied in assessments from the stockholders,[2] yet the superintendent was obliged to report, with regret, that the expenditure was apparently fruitless.[3] The quoted value of the mine fell to $72,000 during the month of June, 1870,[4] and its stockholders were utterly discouraged.

The only person interested who had not lost heart completely was the superintendent, John P. Jones. His desperate venture at the time of the Yellow Jacket–Crown Point fire was characteristic, and probably no man on the lode was better fitted to lead a forlorn hope. He was born in Herefordshire County, England, near the border line of Wales, in 1829, but is an American by virtue of a life's training and surroundings. His parents crossed the Atlantic and settled in the State of Ohio when he was only two years old, and the boy was educated and employed in Ohio until he sailed from Cleveland (through the Welland Canal) for San Francisco

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[1] Annual Report Crown Point Mining Company, 1869, p. 13.

[2] *Ibid.*, 1870, p. 13.

[3] *Ibid.*, p. 9.

[4] *Vide* Tables in San Francisco Stock Report, December 29, 1879.

September 26, 1849.[1] In California he had been engaged in various mining enterprises and filled several public offices with credit before his nomination as Lieutenant Governor on the Republican State ticket in 1867. Although running considerably ahead of his ticket he was defeated in the election, and crossed the Sierras to Nevada almost penniless, as his limited means had been exhausted by the necessary expenses of the campaign. Upon his arrival on the lode his services were at once engaged by the Kentuck Mining Company,[2] and he showed himself so competent in the discharge of his duties that the Crown Point Mining Company, whose mine adjoined the Kentuck, offered him the post of superintendent in 1868. Since his appointment he had conducted the search for ore with untiring zeal, and his ability was expressly recognized by the directors.[3] The lack of success could not be attributed justly to any short-coming on his part, but no display of skill would compensate for the absence of ore.

In June, 1870, there was no ore in the mine which was worth extracting, and no indication of the existence of any undeveloped body.[4] Explorations on the 1,000 and 1,100-foot levels revealed nothing but porphyry and barren seams of quartz, though on the lowest level a prospecting cross-cut had been driven due east from the shaft for a distance of 800 feet. Further search to the eastward was, therefore, abandoned, and a drift begun at a point 360 feet east of the shaft and extended southward, without any favorable indication for more than 200 feet,[5] thus aggravating the disheartenment of the stockholders, if this were possible.

In November, 1870, shares were offered at $2, with no buyers.[6] The entire mine property was thus appraised at $24,000, though the nominal assets in mine and mill plant alone were $140,000;[7] an exhibit which gives a fair illustration of the market value of a barren mine and the security offered for the allowance of overdrafts. The treasury of the company was empty and further assessments were impossible.

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[1] Gold Hill News, August 29, 1873; Authorized Biographical Sketch.

[2] Virginia City Territorial Enterprise, December 1, 1867.

[3] Annual Report of the Crown Point Gold and Silver Mining Company, 1869, p. 5.

[4] *Ibid.*, 1873; Superintendent's Report, p. 7.

[5] *Ibid.*, p. 8.

[6] San Francisco Stock Report, December 22, 1879.

[7] Annual Report of the Crown Point Gold and Silver Mining Company; Statement of Assets, p. 17.

At this crisis a change of importance was noted in the character of the lode rock. For years the workings had been in hard, gray porphyry, but the new drift began to enter a different formation.[1] Streaks of quartz and clay appeared, the porphyry became more decomposed and friable, lighter in color, and seamed with straggling red lines of iron-rust. A well defined clay seam was reached at a point 239 feet from the beginning of the drift,[2] and when this was pierced a body of soft whitish quartz was developed which contained bunches or pockets of ore. This improving prospect so favorably impressed the superintendent that he determined to go to San Francisco and personally present his views of the condition of the mine to its owners. His representations had due weight, and a number of speculators bought in all the shares procurable at low prices. But during his stay in California one of the usual stock reactions occurred. The latest developments in the mine were apparently less promising, and some of the more timorous holders began to lose confidence. The superintendent's faith did not waver, as he says, but he had reasons for exercising more than common prudence, for his daughter was dangerously ill, and he was momently awaiting a telegram which would call him to the Eastern States and constrain him to be absent for some weeks at least from his mine. Several prominent operators were then carrying a large amount of stock on his account, upon his agreement to bear all losses in consideration for one-half of the possible profits. He told these men of the illness of his child and the probability of his own departure, and settled the outstanding account by the disposal of the shares in their hands. Though he assured them of his firm belief in the value of the mine, and he still held a considerable number of shares, his action belied his words in their minds. They regarded the story as a lame pretense to explain his stock sales, and could scarcely refrain from laughing in his face. "Jones' sick child" became a by-word in a privileged circle, and when he returned to Virginia City it was the prevalent impression that the real invalid was the Crown Point Mine. The superintendent bore these sneers coolly, and when he ascertained by careful inspection that the developments as a whole, during his absence, were unmistakably favorable, he telegraphed at once to his agents at San Francisco to buy largely in addition to shares which he still held. Meanwhile his former partners in the speculation were selling short to all buyers, and when the value of the mine became evident to all, a few weeks later, their losses in redeeming outstanding obligations were heavy.[1]

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[1] John P. Jones.

[2] Superintendent's Report; Annual Report of Crown Point Mining Company, May, 1873, p. 8.

One leading stock operator, Mr. Alvinza Hayward, had been more credulous and gained a fortune in consequence. His purchases were made so rapidly and shrewdly that he obtained 5,000 shares, nearly half the entire stock of the company, at prices averaging less than $5 per share, as is alleged.[2] Mr. Charles B. Low, another prominent speculator, secured at the same time 1,000 shares for $4,300, including brokerage charges. As the value of the mine rose, upon the reported developments in the spring of 1871, Mr. Low disposed of 700 shares at from $90 to $120 per share, the greater portion of which were bought in for Mr. Hayward, as was reported. A cross-cut on the 1,200-foot level entered the same body of ore found above in May, 1871; the price of shares bounded upward at once, and Mr. Low then sold the shares remaining in his possession to Mr. Hayward at $180 per share. It was apparent that the latter was determined to obtain control of the mine. Only one man had the power and the will to oppose him. Mr. Sharon had control of 4,100 shares, and would not concede defeat without a struggle, for the value of the prize was too well known, and the independent action of Mr. Hayward was viewed as an attack upon the combination of which he was a member. The fortified monopoly was seriously threatened and the danger was realized. For a time it seemed that a contest over the election of trustees was inevitable, far surpassing in excitement any previous rivalry, but Mr. Sharon coolly weighed the chances of success and the certain cost of the struggle and decided to withdraw from the field. Accordingly he sold all his stock, 4,100 shares, to Mr. Hayward for

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[1] John P. Jones.

[2] San Francisco Morning Call, June 10, 1871.

$1,400,000, on the 7th of June, 1871, thus making the largest private transfer of mining stock on record.[1] It is probable, however, that this virtual defeat rankled sorely in his mind, and that he has never forgotten the concerted action of Alvinza Hayward and John P. Jones in wresting the control of the mine from his hands. To thus outwit the head of the combination either prior and more accurate information must have been obtained by Mr. Hayward, or he must have been the more daring speculator of the two. Mr. Sharon attributed his defeat to the first cause assigned. It matters little whether he was right or wrong in his surmise, and the public had no reason to concern itself greatly about his disappointment. It was apparently a case of diamond cut diamond and was regarded as a personal matter strictly. As a stockholder in the Union Mill and Mining Company he suffered a further loss in their failure to secure contracts for the reduction of ore from the new bonanza. Some of this ore was crushed in the mill of the Crown Point Company, but the larger portion was reduced in the mills of a new corporation, the Nevada Mill and Mining Company, which was organized and controlled chiefly by Mr. Hayward and Mr. Jones. Yet, though disappointed in his plans for personal enrichment, Mr. Sharon had reason to congratulate himself, as agent of the Bank of California, upon the results of the new discovery. It is a curious fact in the history of mining that the opening up of a bonanza in any part of a district generally causes a rise in the market value of all mines in that district. If the mines were on sections of the same vein this advance might be less singular, but often mines on distinct and distant veins are likewise benefited. In the case of a lode like the Comstock there was no reason why the development of an ore-body in the section owned by the Crown Point Company should cause the section of the Ophir Company to become more valuable, except that the bonanza in the Crown Point was a convincing proof of the possible occurrence of rich ore-bodies at a deep level, which had been openly doubted. There was no likelihood that the Crown Point ore-body would extend more than a few hundred feet north of the boundary line of the mine, yet it was such an encouraging indication of the probable richness of the unexplored fissure that the quoted value of nearly all the mines on the lode bounded upward as soon as the importance of the new development was generally realized.[1]

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[1] William Sharon.

This extraordinary increase in the market value of the mines was a certain though indirect benefit to the Bank of California, for stockholders responded willingly to the call for contributions to continue the work of prospecting. The depleted treasuries of the mining companies were refilled, outstanding liabilities were paid promptly, and the Bank of California, the principal creditor, received back its advances with interest. Moreover, the whole district was benefited by the improved condition of the stock market. Mill property advanced at once in value, the price of improved real estate rose sharply, and all branches of business felt the quickening stimulus of the influx of capital and the increase of confidence. Thus any mortgages held by the bank as security for advances were made negotiable, while before the discovery they would not have realized at a forced sale one-third of their face value. The bank was therefore lifted above the fear of loss, the towns on the lode were made prosperous, and a few stockholders greatly enriched by the new development.

The only men who did not join in the general exultation were those stockholders who had sold their shares in the Crown Point Mine before the rise. If they were not fully apprised of the extent and richness of the bonanza as rapidly as the developments were made they had cause for grave complaint; if they knew the condition of the mine as thoroughly as the principal stockholders and trustees, but were not equally daring gamblers, they had only themselves to blame for their mistake.

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[1] San Francisco Stock Report, December 22, 1879.

	NOVEMBER, 1870, HIGHEST SELLING PRICE.	JUNE, 1871, HIGHEST SELLING PRICE.
Crown Point	$7 00	$340 00
Belcher	3 00	245 00
Yellow Jacket	37 00	77 00
Savage	40 00	60 60
Hale & Norcross	118 00	72 00*
Gould & Curry	94 00	178 00
Ophir	4 00	10 75

*The exceptional decline in the Hale & Norcross mine shares was due to the discontinuance of the monthly dividends in May, 1871, though the quoted value of the stock was blown up in July, 1871, to $145 per share, thus confirming the general statement made.

It is certain that the stockholders of limited means were not as venturesome as Mr. Hayward, nor as able to purchase; but it can scarcely be doubted that their knowledge of the true condition of the mine was less complete and accurate. It had not been the custom to furnish full and prompt bulletins of progress for the use of stockholders, and the directors of the Crown Point Mine had no apparent wish to figure as reformers. A stockholder who relied simply on the meagre official publications for information would have leaned upon a broken reed. If the majority of stockholders had held their shares as an investment strictly there would often have been a passion stirred among them which would have swept away unfaithful boards of directors and compelled halting superintendents to do their duty; but it was notorious that shares were held for speculative purposes usually, and that a well-managed stock "deal" was as acceptable to most holders as an actual development of ore. Stock deals were naturally easier to produce than ore-bodies, so that the gambling public was commonly given chaff instead of wheat. If buyers and sellers were willing to deal in counterfeit coin they had only themselves to blame when their riches turned to ashes in their hands, as in the well-known fable. Inefficient complaints were heard occasionally from one quarter or another, but protests against stock deals were never loud and emphatic. Now, the very essence or possibility of a stock deal lies in the ignorance of the great body of buyers and sellers of the true value of their stock, or in their belief that only a few leading manipulators know its true value. If the public at large were permitted to know the actual condition of a mine stock deals would become impossible. Stock-gambling might indeed continue, based on various estimates as to the extent of the ore-body; but an empty stock-bubble would be a thing of the past. To insist, therefore, on the faithful performance of duty by mine trustees and superintendents would be the death-knell to stock deals, and it is fair to assume that the majority of shareholders in the Comstock mines did not wish this conclusion. If they did wish it why was their demand not made effectual? The responsibility for their inaction cannot be thrown justly upon the shoulders of a few leading speculators. Excuses can always be found for stupidity and avarice. If the public was tempted and deceived at first by a dazzling bait, artfully displayed by a few designing men, years of experience should have opened its eyes. All feasible tricks and devices were stale in 1870. If the plea of powerlessness is urged it falls to the ground. Union and coöperation of honest investors gives power, and this course was always feasible; for when a mine could not be purchased and controlled by such an organization why should a scrupulous investor hold a share of its stock? Honest men might incur losses occasionally, it is true, from the unworthiness of trusted agents; but if agents were sharply supervised such losses would be rare and inconsiderable. If a man has neither time nor inclination to watch his own interests or investments, he should rarely buy shares in a mine. His carelessness, of course, does not palliate the crimes or faults of his agents, though it places temptation in their way; and such easy-natured indifference as this has proved most harmful in its effects. The officers of any mining company who failed to report to its stockholders the true condition and prospects of their mine, to the best of their knowledge and belief, whenever such information was due, were clearly derelict. To enforce this requisition in all companies holding mines on the Comstock Lode might have been a Utopian plan, for the justice of a measure has not always made it practicable; yet such coöperation of honest investors as has been outlined was clearly possible and the control of any mine secured at will. If this course was not followed, it is apparent that there was no general or effective desire for reform; and if stock purchasers were content with their acquisitions why should uninterested spectators complain?

It is true that a committee was appointed by the San Francisco Board of Brokers in January, 1870, to devise a method, as the Territorial Enterprise pithily stated, "of dissipating the fog which hung over the management of the Comstock Mines." Majority and minority reports were accordingly submitted, the latter "by a gentleman who is evidently willing to be befogged;"[1] the former recommending action to procure the passage of a law compelling the trustees, superintendent, and secretary of every incorporated mining company to file in the offices of designated county clerks sworn statements quarterly, showing amount of work done, money received and expended, by itemized accounts, and condition of the mine as clearly as possible. It was further recommended that such companies should be required by law to award contracts for crushing their ore to the lowest responsible bidder when mills were not owned by the corporations, and to limit all contracts so awarded to a period not exceeding three months. Meetings of the stockholders were to be called by the trustees whenever demanded by persons unitedly representing one-quarter of the capital stock of any company, under penalty of fines upon conviction for non-compliance. These provisions were apparently just in the main and practicable. They were not sufficient, and might be evaded, but were commendable as the first step toward reform. Yet the report died stillborn, for the board took no earnest action to present the subject to the attention of the legislature, and neglected even to take the simply effective measure of refusing to buy or sell the shares of any mine whose officers refused to comply with reasonable regulations guaranteeing protection to stockholders. The brokers would not act, and it is certain that stockholders generally accepted the existing condition of mine management without strong protest. If they hoped for reform without exertion on their own part they were assuredly optimistic; if they wished for no change they merited no sympathy when their speculations were disastrous. Hence it was that the stockholders of the Crown Point Mine, who had sold their shares at low prices to Mr. Hayward and others, did not grumble loudly when the bonanza was fully made known, for they had, in a measure, forfeited their right to complain when they allowed the Crown Point Mine to be managed like most of the other mines on the lode. Under existing customs in the district the neglect to furnish clear and full bulletins was not so directly contemptuous of the rights of stockholders as another practice, which endured for a long time unchecked.

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[1] Territorial Enterprise, February 5, 1870.

When miners were beginning to explore a new level in the lode by cutting a gallery from the shaft toward the ledge, and were on the point of piercing the east or hanging wall, the custom grew up of confining the men at work for days below the surface. The object of this confinement was evident. It was believed that ore-bodies existed most commonly close to the east or boundary wall, and the directors of mine companies desired to hold any information gained by piercing the ledge for their exclusive use. To imprison the miners was the best guarantee that they would not make premature disclosures; so the trustees became jailors for the time being. The miners so held did not usually grumble, as they were fed and cared for with particular attention, and their wages were often temporarily increased. If all stockholders in a mine had been apprised daily of the developments thus made the practice might not have been objectionable, but as a matter of fact many were kept ignorant of the progress made and the results of the exploration by the wilful neglect or refusal of the trustees to accord the information desired.

The credit of this invention probably belongs to the controllers of the Gould & Curry Mine in 1863.[1] Five years later it was termed a common practice,[2] and few objected loudly when, in January, 1868, the superintendent of the Hale & Norcross Mine confined twenty-five miners within the hoisting-works of his mine for three days while piercing the partition selvage of clay on the 930-foot level. The men were paid $12 per day and were willing prisoners. On their release, January 10, 1868, it was reported that some rich ore had been found.[3] The stock of the mine, which was quoted at $1,300 per foot on January 8th, rose to $2,200 per foot January 11th, and a contest for the control of the mine at once ensued which raised the price of shares far above their true value. In this instance it was possible that the report was well founded, though the product of the Hale & Norcross Mine during the year and the suspension of dividends did not strongly confirm it, but the advantage of ascertaining the facts of the case, as a guide in the purchase or sale of stock, was evident. A reported strike might be nearly as profitable as a genuine discovery. Unfortunately for these speculators, confidence in all reports was so greatly shaken before the close of 1868 that when the same plan was tried by the superintendent of the Imperial Empire Mine in February, 1869,[4] while cutting through the east clay wall on two levels, the stock of the mine began to fall in value at once. The eighteen miners at work on these levels were confined in the mine for seven days (February 12th to

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[1] Territorial Enterprise, January 19, 1871.

[2] Gold Hill News, February 15, 1869.

[3] Gold Hill News, January 11, 1868; Territorial Enterprise, January 11, 1868.

[4] Gold Hill News, February 15, 1869.

19th,) during which time the quoted value of the mine decreased nearly one-third—a result not anticipated by their jailors.[1] The Gold Hill News, in commenting on the absurd failure of the plan, hoped "that this old dodge had been played for the last time,"[2] but the hope was not realized; for it was not until February, 1872, that the scheme was effectually exploded.

The Savage Mining Company had resorted to this device with success in the first week of February, 1872, cutting into a small body of rich ore, and thereby raising the quoted value of their mine fourfold.[3] So the Ophir Mining Company, in opening up the 1,100-foot level of their mine, confined four miners, without anticipating the spirited protest which ensued.[4] For some reason a rumor arose that the imprisoned men were held by force within the mine, and this report was widely circulated by discontented stockholders.[5] The miners on the lode have always been jealous of encroachments which threatened their personal independence and privileges, and in this case their disgust at the action of the Ophir managers was heightened by sympathy for their friends. Notice was publicly given that writs of *habeas corpus* would be served on the superintendent of the Ophir Mine, and that suits for damages on the score of illegal detention would be instituted on the release of the four prisoners. Mining stocks have always been peculiarly sensitive to depressing rumors, groundless or well founded, resembling flimsy towers reared high in air, whose walls will crumble in ruin should a slight earthquake displace one stone of the edifice. So the threat made by the friends of the prisoners awakened a slumbering disgust at the "shutting-down process," as the plan was termed, which completely foiled the plans of the mine managers. Disgust produced distrust, as in the case of the Imperial Mine stock sale three years before. Shares of the Ophir Mining Company were thrown on the market at any sacrifice,[6] and the stock which was quoted at $105 per share on February 23d fell to $40 on February 28th. The Ophir Mine managers did all in their power to check this fall, but their efforts were fruitless. A card was published in the Territorial Enterprise, February

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[1] Gold Hill News, February 18, 1869.

[2] Gold Hill News, February 19, 1869.

[3] *Ibid.*, February 6, 8, 1872.

[4] *Ibid.*, February 27, 1872.

[5] *Ibid.*, February 28, 1872.

[6] *Ibid.*, February 28, 29, 1872.

29, 1872, signed by the four imprisoned miners, certifying that they remained under ground by their own consent; but this prop was inserted too late. The shock to the reputed value of the mine was so great that its effects were lasting, and the lesson was a serviceable one; for Comstock Mine controllers then realized that the shutting-down process was a dangerous experiment; and that to be hoisted in their own petard was unpleasant. So far as is known the device was not again used.

Besides the immediate ill effects occasioned by such short-sighted management a most serious and lasting injury to the general welfare of the district was wrought in the prevailing distrust which acts like these excited. How deep-seated and far-reaching was this distrust appeared unmistakably in May, 1872, when a scandalous accusation, which otherwise would not have gained credence for a moment, was potent to horrify the public, reduce the market value of a mine one-half, and precipitate a general fall in mining stocks. The cause of the terrible mine fire in 1869 had never been absolutely determined. The careless placing of a lighted candle near the dry timbers of a drift was the probable explanation, but in the unreasoning excitement of the scene which followed, a rumor was muttered about that the fire was purposely kindled as a device to bear the market in San Francisco and enable certain speculators to buy in the stock at a low valuation. It was said that the originators of this plot intended to extinguish the fire in a few hours, as soon as the telegraphic report of its outbreak should have depressed the value of the mine sufficiently for their purpose, but that in the execution of their design some one had fatally blundered. The grave absurdity of this charge was manifest. The perils of fire in mines were clearly known, and stocks could be depressed at the will of mine managers by methods far less bungling and dangerous; but granting, for the sake of the argument, that scoundrels who would form such a plot lived in the district, it was morally certain that they would have shown some trifling foresight and care, at least, in its conduct. It was clearly kindled at an unsuitable hour, for if the fire was intended merely as a scare it could have been controlled or extinguished before the opening of the stock-boards in San Francisco, and an unchecked conflagration would injure the mine too seriously for any speculative purposes. No stock speculator would have allowed a fire which he had been instrumental in kindling to burn so long unwatched and unchecked before the alarm was given, and even the vilest gambler would have contrived to save the lives of the innocent men who died beyond the reach of help. These facts are so patent that to attribute this fire to the hand of a trained miner appears preposterous, and it was so regarded on the Comstock Lode when the maddening excitement of the first days of the fire subsided. The wretched rumor was apparently forgotten, when it was revived three years later in the form of a published denunciation of George F. Kellogg, foreman of the Crown Point Mine in 1869, as the incendiary, and the insinuation that the superintendent of this mine was privy to the design.[1] The principal accuser was Isaac S. Hubbell, underground foreman of the Yellow Jacket Mine at the time of the fire, but serving as a guard at the Nevada State Prison in 1872. His evidence, when carefully sifted by a grand jury a few months later, at the request of those directly and indirectly accused, was found to be worthless; for, after examining Hubbell and others closely in regard to the breaking out of the fire, the jury reported unanimously that Hubbell's statements were "without foundation and seemingly the result of personal malice."[2] As this jury was composed of citizens of high character their report must be accepted as conclusive, in default of any evidence to the contrary; yet the unsupported declaration of Hubbell produced a panic among the stockholders of the Crown Point Mine which reduced the market price of their shares to one-eighteenth of their former value and hurried on a general fall in mining stocks.[3]

A depression so extraordinary was not, of course, due to this rumor alone. A development in the Savage Mine, which at the time was thought most promising, proved to be of small importance when the extent of the ore-body was more fully determined, and the inflated stock began at once to sink in spite of the frantic efforts of the bulls in the San Francisco

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[1] San Francisco Daily Chronicle, May 8, 1872; Statements of James O'Donnell and Isaac S. Hubbell.

[2] Report of Grand Jury, August 8, 1872; Gold Hill News, August 10, 1872.

[3] San Francisco Stock Report Tables, December 22, 1879:

CROWN POINT MINE SHARES.
Highest price, May, 1872, $1,825.
Lowest price, May, 1872, 100.

Exchange to stay the tide. Mr. Hayward and Mr. Jones were known to have control of a majority of the stock[1] and to have been most sanguine as to its ultimate value, but when the truth in regard to the ore-deposit was learned, they could no longer venture to maintain the price of the stock or prevent its swift decline. In April, 1872, the stock had sold at $725 per share, or $12,600,000 for the entire mine,[2] more than the Crown Point was worth, the most productive on the lode. Such preposterous inflation proved disastrous to many speculators, for when the bubble was pricked the stock dropped to $175 per share, and, as usual, dragged down the whole market in its fall. Mr. Sharon and other large operators did not see fit to bolster up the sinking stocks, and it was currently reported that heavy sales were made on their account.[3] Whether this is true or not, it is certain that no custom of the Stock Exchange or precedent among speculators prevents any one from disposing of his stock or purchasing whenever he finds it profitable to do so. It is absurd to suppose that men who gamble in stocks will consult the interests of others before their own, though they may be foolishly berated for not doing so. The financial editor of the San Francisco Alta, a shrewd and careful observer, wrote, May 19, 1872, that the decline was occasioned mainly "by sales 'for account' and sales of brokers where the call for margins was not responded to. These were on country accounts to a considerable extent. A large amount of the shrinkage has not been actual loss, but its nominal gains." This last statement was undoubtedly true, though it did not console the stockholders who had failed to sell out before the fall. These unlucky speculators realized two things keenly, that the decline was the most rapid and great which the San Francisco stock-market had ever known,[4] and that their paper fortunes had melted into thin air.

Still, though the effects of this panic were deeply felt by unsuccessful stock gamblers, the general confidence in the probable existence of ore-bodies below the working levels was unimpaired. The discovery of the

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[1] San Francisco Chronicle, May 19, 1872; Editorial.

[2] San Francisco Stock Report, December 22, 1879.

[3] San Francisco Call, May 16, 1872.

[4] "Mining stocks have declined over $50,000,000 in value within a fortnight, the decline in a dozen leading stocks alone being nearly half that amount in the last week;" San Francisco Evening Bulletin, May 17, 1872.

Crown Point ore-body was made known to capitalists in this country and abroad, and a stimulus to investment was thereby given which probably secured the prosecution of the great mining enterprise of Adolf Sutro. Some of the mining companies who had expected to find the lode nearly dry at the depth of 1,000 feet began to realize how far water could percolate through the seamy and decomposed rocks of the basin at the foot of Mount Davidson, and how extensive was the area of drainage. Still, in spite of the existence of large pockets of water, so-called, in all parts of the lode, and the continuous fight carried on by a few mining companies against its inroads, the total amount encountered annually throughout the length and breadth of the lode was much less than in 1866. The evidence attesting the diminution of the water-plague is conclusive to an unprejudiced observer. The affirmations of the superintendents, the testimony of working miners, and the expense accounts of the mines are incontrovertible witnesses to this fact when united, as they are, in its confirmation. It is equally idle to allege that no mining companies on the lode were seriously inconvenienced by the presence of water, as was affirmed in the heat of the opposition to the Sutro Tunnel project.

In some mines the fight went on year after year against an enemy which seemed to lie in wait for their advances and dispute the ground with them inch by inch. Foiled at one point, it would apparently withdraw to break in upon them again when they were off their guard and working in fancied security; and when its hydra heads were lopped off at one place new ones would spring up elsewhere with inextinguishable vigor. To chronicle such a contest is to write down an unvaried record of flooded shafts and levels, of temporary drainage, and of new inbursts of water; or, more discouraging still, of broken pumps and of delusive gains, when the battle was really a drawn one and the pumps could only hold the rising water in check. So in April, 1868, an observer noted regretfully that the new shaft of the Imperial Empire would not be so readily drained as was hoped,[1] and at the end of the following month the inflowing water was still the great drawback to any knowledge of the ledge.[2] In June an injury to the guides in the shaft put a stop to bailing with the hoisting-tanks for several hours, during which time the water rose four feet above the floor of the lower level.[1] The fight was soon renewed, but the water was indomitable, and when the tank-cable broke under the ceaseless strain, in March, 1869, the rising flood filled the shaft to the depth of 100 feet before a new cable could be procured and adjusted.[2]

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[1] Territorial Enterprise, April 30, 1868.

[2] *Ibid.*, May 23, 1868.

In the Gould & Curry Mine work in the lower levels had been suspended in 1866 owing to the water encountered,[3] and during 1867 the new pumping-engine was at work continuously in order to keep the water in check. Even in the spring of 1868 the influx was still so great that it was necessary to put in additional pumps, and when four pumps began to drain the mine in April the water had risen in the shaft to the depth of nearly 500 feet.[4] In June of the same year, when the shaft had reached the depth of 964 feet, it was reported that the pumps were still in constant operation,[5] and they so continued until a breakage occurred in March, 1869, when the water rose to the height of 320 feet in the shaft while the pumps were undergoing repair.[6] Foot by foot, however, the water was driven back,[7] though every inch was won and held by a never-ceasing contest, so that even in May, 1873, when the shaft had reached a depth where it was predicted that little water would be found—the 1,700-foot level—the main incline was progressing slowly owing to the inpouring water, which could scarcely be held in check by the pumps.[8]

Most instructive of all is the record of the Ophir Mine, as full official reports are here accessible and comparatively exact estimates can be made in regard to the amount of water raised. Exploration in this mine had been practically abandoned since 1865, owing to the entering floods of water more than to the exhaustion of its surface ore-body. During the autumn of 1867 the company decided to sink a new shaft east of their old works, and cut the lode at a lower point, where it was hoped that the water would not be so troublesome and the quartz would be less barren. Water was encountered in this shaft in October, 1867,[9] when less than fifty feet from the surface, and it was soon found necessary to put up a pumping-engine which, in conjunction with the hoisting-tank, could raise 300 gallons per minute.[1] The pump was of 10-inch diameter with 6 feet stroke, giving an estimated capacity of 24 gallons per stroke. On the 10th of April, 1868, sinking was begun anew,[2] all work having been suspended for three months owing to the water influx, and for a month, with the pump making from 6 to 8½ strokes per minute, it was possible to continue work. On June 10th, the shaft being then 287 feet deep, two 12-inch plunge-pumps were substituted for the two 10-inch pumps then in use,[3] which enabled the superintendent to cope with the incoming streams, having an average flow of 16 miner's inches, as he estimated June 21, 1868. If this estimate was correct, the pumps were raising 1,000 tons of water in round numbers every 24 hours. This influx continued with little change until December, 1868, when a considerable diminution in the flow was noted, the shaft being then 537 feet deep.[4] In October, 1869, in drifting a short distance from the shaft a water-chamber was cut,[5] from which a flood poured so violently that it rose irresistibly in the shaft, though the pumps were worked at their full capacity and discharged 20,000 gallons hourly.[6] On the 6th of November the water was 270 feet deep in the shaft,[7] covering the lower plunge-pump, which soon ceased to work and was submerged to a depth of 200 feet.[8] The superintendent was aghast. His own mine did not furnish facts to support his theory of the marked decrease of water with progress in depth. There was only one recourse. A new engine was set up to raise two bailing-tanks holding 800 gallons, and early in December, with pumps and tanks in full operation, the fight was renewed more vigorously and kept up without intermission, except for the necessary repairs, until April 11, 1870, when the drift was drained through which the flood had first poured six months before.[9] The water had proved a "monster elephant," as the superintendent was compelled to admit, and the consumption of wood by the engines was "perfectly frightful," but he still was blind professedly to the advantages of a drainage tunnel. The powerful pumps held the water in check, but the strain on the machinery was so great that rods and gearing began to break frequently, and valuable time was lost in repairs and in pumping out water which would fill the lower levels whenever a pump was stopped for any cause.[1] On January 2, 1872, when the new superintendent, Philip Deidesheimer, assumed charge of the mine, three 12-inch plunger-pumps and one of 10-inch diameter were in service, and 146,000 gallons of water were raised daily from a depth of over 1,200 feet. (Depth of shaft January 1, 1872, 1,255 feet.)[2]

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[1] Territorial Enterprise, June 27, 1868.

[2] *Ibid.*, March 28, 1869.

[3] Mining and Scientific Press, December 8, 1866.

[4] Gold Hill News, April 30, 1868.

[5] Virginia City Trespass, June 6, 1868.

[6] Territorial Enterprise, March 28, 1869.

[7] Mining and Scientific Press, April 3, 1869.

[8] Mining and Scientific Press, May 31, 1873.

[9] The Sutro Tunnel, p. 791; Extracts from Official Letters of Superintendent P. S. Buckminster, Nov. 8, 1867.

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[1] P. S. Buckminster, April 2, 1868.

[2] *Ibid.*, April 10, 1868.

[3] The Sutro Tunnel, pp. 794–796; Letters of H. H. Day, June 10, 1868.

[4] H. H. Day, December 2, 1868.

[5] *Ibid.*, October 16, 1869.

[6] *Ibid.*, November 16, 1869.

[7] *Ibid.*, November 6, 1869.

[8] *Ibid.*, November 10, 1869.

[9] The Sutro Tunnel, pp. 796–802; Letters of H. H. Day, November 10, 1869, April 11, 1870, February 14, 1870.

If the majority of the mines on the lode had been as troubled by water as the Ophir, Mr. Sutro might have used this record with more effect. The direct and indirect costs to the Ophir Company occasioned by the presence of water in their mine were estimated by their new superintendent at $6,000 monthly, or $72,000 per year.[3] Their ore product for several years past had been practically nothing, so that a clear saving to the stockholders would have been effected of at least $60,000 yearly if a tunnel had drained their mine. Still the Ophir Mine was notoriously the wettest on the lode in 1871, and as the tunnel, if begun in August, 1867, in accordance with the terms of the original contract, could not have reached the lode as early as 1871, the cost of pumping prior to that time was unavoidable. What would be the condition of the lode when the tunnel was completed, and how considerable a service would then be rendered, were clearly undeterminable questions in 1871.

Since 1867 Mr. Sutro had been endeavoring with tireless energy to raise money for the prosecution of his scheme and to make head against the quiet but formidable opposition of the corporations controlling the lode. He submitted the memorial of the Nevada Legislature to the House Committee on Mines and Mining in the winter of 1867–68,[4] and set forth the claims of his enterprise to the recognition and assistance of the nation so earnestly and urgently that the committee became warmly interested in the enterprise, and at length reported to the House, recommending a loan of $5,000,000, with a mortgage to the Government on all the property of the Tunnel Company.[1] The impeachment of the President was a matter of such engrossing interest that no action was taken by Congress upon this report, and Mr. Sutro was naturally disheartened, though never flinching from his undertaking. In the summer of 1869 the Ways and Means Committee of the House visited the Comstock Lode,[2] and went away strongly impressed with the advantages of the tunnel. A few months after their visit, as Mr. Sutro had succeeded in obtaining a little capital by subscriptions in Nevada and California, work was begun on a small scale at the mouth of the proposed tunnel on the 19th of October, 1869.[3] When once begun Mr. Sutro was determined that it should never cease until the tunnel was completed, and his struggle to raise funds for its prosecution is one of the most extraordinary financial exploits on record. The outbreak of the Franco-Prussian war was fatal to his plans for raising money in Europe at the moment when they seemed most promising (July, 1870–'71),[4] and, foiled in this endeavor, he applied again to Congress, in the spring of 1871, for a commission of engineer officers to make an examination of the condition of the lode[5] and the utility of the projected tunnel, hoping to secure an appropriation in aid of his scheme if the report of the commission was favorable. His application was granted, and in accordance with a vote of Congress, approved April 4, 1871, H. G. Wright and J. G. Foster, Lieutenant-Colonels of Engineers and Brevet Major Generals, U. S. A., in conjunction with Professor Wesley Newcomb, C. E., were appointed as the board of commissioners. In December, 1871, this commission reported favorably upon the geological and practical value of the tunnel as an exploring work to determine the ore-bearing character of the Comstock and other ledges lying to the east, at great depths; but its utility as a drainway and as affording ventilation to the mines was judged to be small in comparison with its cost. Whether reduction-works could be profitably erected at the mouth of the tunnel for the concentration of low-grade ores—a most important question—was left undetermined; but unless a more complete examination should establish this point beyond doubt the commission did not consider that the extension of the tunnel would prove an economical method of operating the Comstock Mines.[1] As it was not probable that Congress would vote a large subsidy to explore a ledge or ledges which private enterprise was rapidly developing, the report of the commission was practically a serious blow to Mr. Sutro's hopes of aid from the National Government in his project. He must have perceived this, but doughtily refused to confess it, and made a strong plea for his losing cause, ably combating the conclusions of the commission before the Congressional Committee on Mines and Mining, and questioning their premises fairly on the ground that they were derived in great measure from *ex parte* affidavits made by the opponents of his scheme, the superintendents of the Comstock Mines. So ingenious and persuasive an advocate was he that, after an examination of the commissioners and other witnesses, the Committee on Mines and Mining, in face of a plainly unfavorable report by the commission, reversed or ignored their principal conclusions and reported in favor of a loan by the United States of a sum not to exceed $2,000,000 in aid of the enterprise.[2] The bill was not passed by Congress, but Mr. Sutro could not provide against this failure. It is simple justice to recognize his able presentation of the tunnel project and his unflinching contest with discouragements of every kind. Such uncommon energy is certain to gain its end at length, unless the scheme in view is absurd and unprofitable. Mr. Sutro's plan was practicable and promised rich returns to investors. In September, 1871, he succeeded, at last, in obtaining a subscription of $650,000 to the stock of the company, increased shortly afterwards to $1,450,000, from English and European capitalists whom he had persuaded of the advantages of the investment.[3]

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[1] The Sutro Tunnel, pp. 802–808; Letters of H. H. Day, May 13, 1870, June 3, 1870, June 9, 1870, May 5, 1871.

[2] The Sutro Tunnel, pp. 807, 808; Letter of Philip Deidesheimer, January 2, 1872; Official Report, March 13, 1872.

[3] The Sutro Tunnel, p. 809; Letter of Philip Deidesheimer, March 13, 1872.

[4] The Sutro Tunnel, p. 884.

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[1] Report H. R., No. 50, Second Session, Fortieth Congress.

[2] The Sutro Tunnel, pp. 886, 887.

[3] *Ibid.*, p. 889; Virginia City Territorial Enterprise, October 20, 1869.

[4] *Ibid.*, p. 891.

[5] *Ibid.*, p. 893.

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[1] Forty-Second Congress, Second Session, Ex. Doc. No. 15; The Sutro Tunnel, pp. 6–13, Report of Commission.

[2] Report of the Committee on Mines and Mining; The Sutro Tunnel, pp. 956–965.

[3] The Sutro Tunnel, p. 895.

Work at the tunnel was immediately pushed on an enlarged scale. As many laborers as could be employed to advantage were engaged; the necessary machinery was bought, and the adit in the hills, which had been called, contemptuously, "Sutro's coyote hole,"[1] became the greatest mining enterprise in America.

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[1] Gold Hill News, October 13, 1869; Editorial.

CHAPTER XVI.

THE GREAT BONANZA.

The control over the productive mines on the lode held by the Bank of California and the Union Mill and Mining Company had been broken, as was shown by the coup of Messrs. Alvinza Hayward and John P. Jones in acquiring the Crown Point Mine bonanza and by the subsequent formation of the Nevada Mill and Mining Company. It could no longer be said that a single organization was the sole ruler of the Comstock Lode, for its sway was divided, and it was shortly to be reduced to the condition of a second-class power by the rise of a new association styled, half soberly, the "four bonanza kings."

Mr. John W. Mackey, an Irishman by birth, came to the United States, when a young man, and worked for a time as a ship-carpenter in New York. The gold fields of California attracted him to the Pacific coast, and he worked as a miner, with ordinary success, until he crossed the Sierras and began mining on the Comstock Lode. Here the traits of character were first remarked which, coupled with exceptional good fortune, have made him one of the foremost miners in America. His ambition if narrow was far-reaching. He sought for wealth as a world-moving lever, for with money he could, as he thought, attain any end which seemed to him worth prizing. The risks and chances of mining allured him. He cared little for cards, for in the heart of the great lode he saw a game played daily which dwarfed all other gambling, seeing that health, fortune, and life itself were staked on the turn of a drill or the stroke of a pick. He saw millionaires pouring their wealth down the Comstock Mine shafts, and miners toiling night and day in gloomy galleries, blasting and cutting their way painfully foot by foot, groping in the darkness for unseen veins of ore, crushed by falling rocks, stifled by fires, driven back by inpouring floods, fainting from heat, mangled by premature blasts and horrible falls, but never giving up the search while strength and life endured. He saw the weary struggle going on year after year without gaining its end, and sudden smiles of fortune as well, by which the ruined man became rich beyond his hopes. The whirl of the mighty lottery-wheel beneath his feet riveted his eyes, and he longed to be one of the puissant croupiers who turned the wheel and questioned fate. Not to make money for the pleasure of money-making alone, not to be enabled to scatter gold broadcast with prodigal hands, not to be known as a nabob or bonanza king, but to win a name as master and manager of the greatest mines in the world—this was what he sought, as he declares;[1] this was what he won. Fortune was kind to him, but he left no stone unturned to achieve success. His restless eye surveyed the lode from end to end, and he studied every move, even before he had a chance to figure as a player. His insight appeared extraordinary when his ventures turned to gold, but he possessed no divining-rod except close observation, thoughtful consideration, and a swift grasp of opportunities. His cool common sense was a rarely-erring guide. Though apparently a desperate gambler he took no ill-considered risks, for he never professed to see farther into the lode than could be seen by the aid of the pick and drill, and his brain was not heated by visions of ore-bodies, which existed in the fancy of others. Hence he discerned clearly when to hold and when to sell mining stocks, one of the rarest faculties, to judge by results, which has been possessed on the Pacific coast.

A man whose actions are so nerved and balanced is certain to rise to distinction if opportunities are offered. The day laborer became first superintendent of the Caledonia Tunnel and Mining Company; next a large owner in the rich Kentuck Mine, and associating himself with Mr. James G. Fair, the two obtained control of the Hale & Norcross Mine at the election of trustees in 1869. A year before, the control had been gained after an extraordinary contest, during which the price of the mine shares rose from $1,260 in January to $7,100 in the following month;[2] yet this conflict of speculators proved a farcical struggle, for when the mine was won it seemed hardly worth keeping, as only 16,536 tons of low-grade ore were taken out in 1868, and no dividends were declared.[1] The stock naturally fell from $2,900 per share in March, 1868, to $41.50 per share in the following September.[2] Two of the shrewdest observers on the lode began quietly to buy it in at the lowest prices, and were so successful that considerable surprise was expressed when the Gold Hill News announced in February, 1869, that "as J. G. Fair and J. W. Mackey, of Virginia City, own over 400 shares of Hale & Norcross stock, they will be likely to control the election of officers in March;"[3] but the statement was verified. A new board of directors was chosen, Mr. Fair was appointed superintendent, the product of the mine was tripled in 1869 and quadrupled in the following year, and $728,000 was paid in dividends to the stockholders during this period.[4]

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[1] John W. Mackey.

[2] San Francisco Stock Report Tables, December 22, 1879.

How far this success was due to the skill and energy of the new superintendent cannot be determined, but the signal ability of his management was recognized. Like his associate, Mr. Fair was a native of Ireland, and like him, also, had emigrated to America in his youth, and learned the art of mining by varied experience in California. The reported riches of the new silver-ledge district induced him to cross the Sierras in 1860 and take part in the contest going on at the foot of Mount Davidson. Though placed in charge of the Ophir Mine in 1866,[5] and active in other enterprises, his peculiar fitness for the position of mine superintendent was first unmistakably shown in developing and extracting the Hale & Norcross bonanza. He was quick to perceive the value of any novel mechanical appliances of merit, and exceptionally ingenious in designing and adapting them to the requirements of his work. His skill in detecting and tracing up all indications of the existence of ore-bodies was surprising even to trained observers, for so acute was his judgment that it resembled an instinct. Old miners said of him, admiringly, that he "had a fine nose for ore," and the apt metaphor seemed scarcely a figure of speech. He understood the requirements of his position thoroughly and was competent to perform any duty which devolved upon him. The dark and intricate galleries of his mine were an open book to him; every drift, cross-cut, winze, and stope were joined and pictured forth in his comprehension, and the most minute details did not escape him. He passed through his mine at all hours of the day and night, and no lagging or shiftless service under him was possible. His rule was autocratic, his oversight constant, and his exactions strict; yet he was a just master, for honest and zealous work was well rewarded and encouraged, while incompetent men in any position were transferred or discharged; but no man succeeded in shifting the punishment for his own faults upon the head of another. All soon realized that they were under the eye of an overseer whose sight could not be blinded by slothful tricks or lame excuses, and worked unremittingly until the results of their work were seen in the developed bonanza. It is true that his method of supervision and government was often criticised, and sometimes, doubtless, with justice. His manner was generally quiet and urbane, even when he was at heart incensed; but in spite of this apparent mildness he gave such scant grace that men who thought themselves secure from suspicion even were discharged without warning. Though apparently frank-spoken his words were well considered, and he certainly did not wear his heart on his sleeve. His watchfulness was alleged to approach espionage, and his devices for detecting breaches of duty were sometimes more apt than commendable.

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[1] Fiscal year ending January 31, 1869; Eighth Annual Report of the Hale & Norcross Mining Company, March 10, 1869.

[2] Quoted prices after election of Trustees in February; San Francisco Daily Stock Report Tables, December 22, 1879.

[3] Gold Hill News, February 27, 1869.

[4] Ninth and Tenth Annual Reports of the Hale & Norcross Mining Company, 1870, 1871.

[5] Territorial Enterprise, February 8, 1866.

It was soon apparent that the union of two such men as John W. Mackey and James G. Fair was a strong power in shaping the future of Comstock mining. With them, also, were joined, in the direction of the Hale & Norcross Mine, two citizens of San Francisco, James C. Flood and William O'Brien. The last-named trustee was associated with the others by force of circumstances rather than character, adding little strength to the combination except his proportion of capital; but his partner, Mr. Flood, who was chosen president of the new board in 1869, soon evinced such marked talents as a financier and stock manipulator that no one questioned his ability to fill the leading position in the mining exchange and banking circles into which his fortune naturally thrust him. In this association a watchful observer like Mr. Sharon might have seen a power in embryo which was more likely to sap the influence of the Bank of California on the lode than any other existing or probable combination.

Having gained possession of the Hale & Norcross Mine, Mackey and Fair began to purchase mill property, as they were by no means disposed to allow the Union Mill and Mining Company to monopolize the profits from the reduction of ore. The Bacon Mill, so called, of Silver City, was first to begin work for them, March 1, 1869,[1] crushing ore from the Hale & Norcross Mine, and to this was added, in July of that year, the French & Sullivan Mills adjoining, refitted and enlarged.[2] As the ore product which they controlled increased, other mills were acquired to convert the ore into bullion without delay, and with enlarging capital their plans expanded proportionately. The Bullion Mine, near the topographical centre of the lode, had produced nothing since its opening; but its barrenness was not held to furnish any conclusion against the existence of an ore-body at an unknown depth; and perhaps, on the common theory of the equalized distribution of ore at different depths throughout a lode, a mine which had proved barren for years might be more likely to become productive than one which had already yielded a bonanza. Mr. Mackey at any rate, was disposed to make the experiment, and caused himself to be elected a trustee and superintendent of the Bullion Mining Company.[3] A year later his partner, Mr. Fair, was chosen superintendent of the Savage Mining Company,[4] and proceeded to develop their mine with the same skill which he was showing in the adjoining mine of the Hale & Norcross Company. But the ablest superintendents cannot find ore where none exists. Mackey's search in the Bullion Mine was unrewarded, and though Fair prospected energetically, defraying all expenses with the low-grade ore which still existed in considerable quantity in the mine,[5] he failed to develop a new bonanza; and when he resigned charge of the mine, in 1871, he was ready to turn with his partner to an untried section of the lode. The Hale & Norcross bonanza was exhausted, though many thousand tons of low-grade ore remained, and if the partners hoped to hold their place among the leading mine-owners of the lode another venture was clearly called for.

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[1] Gold Hill News, March 3, 1869.

[2] Gold Hill News, July 12, 1869.

[3] *Ibid*, July 12, 1869.

[4] *Ibid.*, November 28, 1870.

[5] *Ibid.*, July 22, 1871; Report of Superintendent Savage Mining Company, for year ending June 30, 1871.

Between the Best & Belcher and the Ophir mines lay a section, 1,310 feet in length, which had been divided up by a number of locators, as noted in a previous chapter. In the northern part of this section some small bodies of paying ore had been discovered near the surface, but they were soon cut out, and as the lode below appeared hopelessly barren and flooded with water no attempt was made to sink shafts deeper than 300 or 400 feet. Yet no barren section of the lode was so rich in possibilities, for it lay between two mines of proven richness, and there was no indication of any fault or break in the line of the lode. The barren cover might well be the shell of a bonanza. The failure to develop this section was due to the lack of well-directed effort, and it afforded a striking illustration of a common habit among prospectors: they rush to a district and make locations as near the first bonanza as possible; then they scratch up the ground vigorously for a short time, but if they find nothing they are soon disheartened or unable through poverty to work longer, and under this stress sell out for a song or determine to hold their claims without working as long as the mining laws permit, in the anticipation of some change for the better, for they are as hopeful as Micawber of something turning up, and generally contrive to rub along, evading the lax laws on one pretence or another. They may be skilled miners, but they are not as a rule patient or industrious, and a combination among them to develop an outwardly barren claim is unthought of or impracticable, for they demand quick returns from their ledges and have no capital to spend in deep mining. One may induce some capitalist to furnish the funds required in consideration of a share in his claim; but this can rarely be done except in surface prospecting, as for mining on any large scale more perfect organization and abler hands are required. The capitalist will not make large advances unless he is allowed to control their expenditure, and the prospector dislikes to let the control of his claim pass out of his hands, fearing that he may be cheated out of the remnant left him. Hence claims have lain unproductive year after year, because their owners were too poor to work, unwilling to sell, and unable to organize a company on any satisfactory basis. The risks and expenses of silver mining are so great that only men of large wealth can afford to incur them, and it is natural that the control of mines should pass into their hands. No laws can be devised to prevent this condition of things, even if such laws were desirable. It is the province of laws to regulate and guard, but not to prevent, the expansion of the mining industry of the nation, and while the rights of the poor should be fairly protected, the theory of law admits of no discrimination against any class, whether rich or poor. Restriction of monopoly should never be a convertible term for a crusade against capitalists, and it is absurd to say that the interests of the poor were justly maintained through regulations which allowed prospectors to hamper the growth of a district by holding more claims than they were able to develop or willing to sell at their market value; for as soon as the first location in a district has been made it is an easy matter to trace out and stake off surrounding ledges, and prospectors deserve only a reasonable compensation for their labor and risks. If the prospects are really alluring, purchasers for claims can usually be found without much delay, if the holders are disposed to accept reasonable offers; but to set imaginary values on their claims, and to act the part of a dog in the manger unless their demands are acceded to, is neither prudent nor fair; for if capitalists were constrained to pay the prices which sanguine prospectors often ask for their undeveloped ledges the locators would soon be far richer than the buyers, and if prospectors are allowed to hold their high-priced claims indefinitely, by virtue of a lame pretense of development, the mining industry will be seriously affected and the whole nation will suffer thereby.

The section between the Ophir and the Gould & Curry was held, at the time of the discovery of the lode, at a price so high that capitalists preferred to buy other sections of apparently equal value which were offered at lower rates. So the Gould & Curry, Savage, Hale & Norcross, and other mines were bought and developed, while the overrated section was left on the hands of its owners. When later they wished to sell, the available capital had been invested in developed mines, and the barren section went begging. The titles to it were clouded, for the original locations were loosely drawn and recorded, the assignments of different owners were scattered far and wide, and the register of deeds was incomplete. If the mining laws had been strictly regarded the greater part of the section might have been re-located legally, but the sentiment of the district was averse to this procedure at the time, and no one cared to risk the probable contest. As long as the re-locator's mine was barren he might be allowed to work with little opposition, but as soon as he should obtain ore, a crowd of claimants would cover the bonanza and dispute its possession. The most preposterous titles would be trumped up as fighting claims, so-called, and the discoverer of the bonanza might count himself fortunate if he rescued his original investment from the hungry mouths of contestants and lawyers.

For a number of years, therefore, the section lay unproductive for the want of workers, purchasers, or relocators. The Central Company (No. 1) had, indeed, sunk a shaft to the depth of 562 feet in 1864, but they found no ore below the 400-foot level, and the influx of hot water was so great that the company became disheartened and attempted no further progress.[1] North and south of it the ledge resounded with the reverberation of blasts, the strokes of picks, and the churning of drills; but within its bounding planes there was no sound of life and industry. The Territorial Enterprise suggested repeatedly, in 1867, the most feasible course for its owners to pursue.[2] "Why do not the California, Central, White & Murphy, Dick Sides, and Best & Belcher form a combination and sink a prospecting shaft to the eastward on a line with the new works of the other leading companies? The companies named own over 1,500 feet of ground in the heart of the great lead, yet make not the slightest move toward its development." The advice of the clear-sighted city editor was not acted upon until 1869, when four of the small associations, the Central No. 2, Kinney, White & Murphy, and Sides, owning 860 feet on the ledge line, determined to prosecute the search for ore systematically.[3]

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[1] Report of United States Commissioner of Mines and Mining, 1869, p. 97.

[2] Territorial Enterprise, August 27, October 16, 1867.

[3] Report of United States Commissioner of Mines and Mining, 1869, p. 90.

They had previously (June 7, 1867) combined their interests by incorporation as the Virginia Consolidated Mining Company,[1] and had rested content with this achievement and attempted no work of consequence; but in April, 1869, an assessment was levied and work was begun with some vigor. During 1869 and the following year $161,349.41 was expended in prospecting without success,[2] and the stockholders lost heart completely; no more assessments could be levied, and shares fell in February, 1871, to $1⅝,[3] at which rate the whole mine (11,800 shares) was only valued at $18,850.

Such was the condition of this section when the eyes of the four venturesome speculators, Mackey, Fair, Flood, and O'Brien, became fixed on it attentively, and they determined to stake their capital upon the chance of finding in it a hidden bonanza. Their purchase was merely a mining gamble, but it was a shrewd and justifiable one, if adventuring capital in any unproductive mine is ever a sound investment. The cost of acquiring the mine at market rates in 1871 could hardly have exceeded $50,000, and its lode section lay between mines of proved richness. Competent attorneys were employed to make a careful investigation of the titles bought and to secure an undisputed and unclouded possession of the property.[4] This was a most difficult task, but a satisfactory title was finally obtained, and the four speculators formally took control of the company on the 11th of January, 1872.[5] Under the direction of James G. Fair a large shaft was at once projected and the work of sinking rapidly pushed. At the same time a drift from the 1,200-foot level of the Gould & Curry Mine was continued north, through the Best & Belcher, into the Consolidated Virginia section.[6] At first the miners cut their way through barren rock; but in the Best & Belcher Mine a thin seam of ore was found, extending northward over the boundary line. This seam was traced by Mr. Fair, as the best guide through the ledge, and followed foot by foot as a thread leading to a clew. Sometimes it narrowed to a film of clay, but it was never wholly lost to the eye of the man who was seeking it as the bloodhound follows his quarry. It was traced for more than a hundred feet into the Consolidated Virginia ground, but the clew seemed as far off as ever. Others began to regard the seam as a will-o'-the-wisp and the pursuit as a wild-goose chase. More than $200,000 had been spent in the search for a bonanza,[1] and the treasury of the Consolidated Virginia Company was nearly empty. Further assessments seemed necessary, and the available funds of the four leading stockholders were not sufficient to endure a prolonged drain. At this crisis Mr. Fair became sick and was obliged to leave the prosecution of the work to others for a month.[2] During his absence the drift was turned toward the east and cut for many feet without success, but on his return to the mine he persisted in following the apparently endless thread. Eleven feet beyond the point where he renewed work, at a distance of 178 feet from the north boundary of the Best & Belcher Mine, a vein of ore seven feet in width, and assaying $60 to the ton, was cut in February, 1873. His judgment was justified, and the first presage of the great richness of the mine was given. Two smaller ore-bodies were found in close connection, and on the 1st day of March, 1873, the main ore-vein had widened to 12 feet, and 25 tons were taken out daily.[3] The shaft was then 710 feet deep, and its progress was urged as rapidly as possible, for the atmosphere in the long prospecting drift was becoming unbearably foul and hot for lack of a ventilating draught, in spite of the supply of fresh air forced in constantly by powerful blowers. In October, 1873, the shaft reached the level of the drift, and the strong current which passed between the distant shafts of the Gould & Curry and Consolidated Virginia mines was welcomed as a true bonanza. In the course of a few weeks a drift ranging to the southeast cut into a rich ore-body at a point 250 feet from the shaft. Skilled miners can take out ore through a narrow drift with surprising rapidity when the work is pressed by an able superintendent. Within fourteen days a chamber was cut in the ledge from 30 to 54 feet in width and 20 feet in height, and a drift extended 140 feet through the vein. Walls, roof, and floor were still ore-surfaces, assaying from $93 to $632 per ton.[1]

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[1] President's Report, Consolidated Virginia Mining Company, 1877, p. 5.

[2] *Ibid.*, pp. 5, 6; Territorial Enterprise, July 6, 1878.

[3] San Francisco Daily Stock Report Tables, December 22, 1879.

[4] George R. Wells, San Francisco, Cal., Trustee of Consolidated Virginia Mining Company, 1879.

[5] Annual Report Consolidated Virginia Mining Company, 1877, p. 5.

[6] James G. Fair.

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[1] Total assessments from April, 1869, to June 11, 1873, $438,499.53; Annual Report Consolidated Virginia Mining Company, 1877, p. 5.

[2] James G. Fair.

[3] Territorial Enterprise, March 2, 1873.

The lid, so to speak, of that wonderful ore-casket, termed commonly the Big Bonanza, had been lifted off. Of its magnitude and richness all were then ignorant. No discovery which matches it has been made on this earth from the day when the first miner struck a ledge with his rude pick until the present. The plain facts are as marvellous as a Persian tale, for the young Aladdin did not see in the glittering case of the genii such fabulous riches as were lying in that dark womb of rock. The miner's pick and drill are more potent than the magician's wand. Under their resistless touch the bars of the treasure-house were broken through and its hoard revealed to the dazzled eyes of the invaders. The wonder grew as its depths were searched out foot by foot. The bonanza was cut at a point 1,167 feet below the surface, and as the shaft went down it was pierced again at the 1,200-foot level; still the same body of ore was found, but wider and longer than above. One hundred feet deeper, and the prying pick and drill told the same story; yet another hundred feet, and the mass appeared to be still swelling. When, finally, the 1,500-foot level was reached and ore richer than any before met with was disclosed,[2] the fancy of the coolest brains ran wild. How far this great bonanza would extend none could predict, but its expansion seemed to keep pace with the most sanguine imaginings. To explore it thoroughly was to cut it out bodily; but the systematic search through it was a continual revelation. Drifts were cut lengthwise in the mass and prolonged hundreds of feet beyond the northern boundary of the mine without passing into barren rock; cross-cuts showed that its known width was from 150 to 320 feet;[3] winzes perforated level after level as ventilating chimneys and ore-chutes, and the heart of the mass was proved to be as rich as the surface layers. The scene within this imperial treasure-chamber was a stirring sight. Cribs of timber were piled in successive stages from basement to dome four hundred feet above, and everywhere men were at work in changing shifts, descending and ascending in the crowded cages, clambering up to their assigned stopes with swinging lanterns or flickering candles, picking and drilling the crumbling ore, or pushing lines of loaded cars to the stations at the shaft. Flashes of exploding powder were blazing from the rent faces of the stopes; blasts of gas and smoke filled the connecting drifts; muffled roars echoed along the dark galleries, and at all hours a hail of rock fragments might be heard rattling on the floor of a level, and massive lumps of ore falling heavily on the slanting pile at the foot of the breast. Half-naked men could be seen rushing back through the hanging smoke to the stopes to examine the result of the blast and to shovel the fallen mass into cars or wheelbarrows. While some were shoveling ore and pushing cars, others, standing on the slippery piles, were guiding the power-drills which churned holes in the ore with incessant thumps, or cleaving the softer sulphurets with steel picks swung lightly by muscular arms.

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[1] The Big Bonanza, pp. 471, 472.

[2] The Big Bonanza, pp. 472, 473; Superintendent's Report, Consolidated Virginia Mining Company, December 31, 1874.

[3] *Ibid.*, 1874, 1875.

Urged on by Fair, Mackey, and subordinate overseers, the working force of miners surpassed all previous records in sending out ore. On the 19th of March, 1875, 461 tons of ore were hoisted through the Consolidated Virginia Mine shaft alone,[1] which was then accounted a notable exhibit; but in March of the following year 908 tons were taken out during a single day through the same shaft;[2] and on November 26, 1877, 1,034 tons were quarried and sent to the surface.[3] This was to be expected, for Roman gladiators were scarcely better fitted for their contests in the arena than these Comstock miners for their labors in the heart of the bonanza. All were picked men, strong, young, and vigorous, fed on the choicest food which the Pacific coast affords, and paid the highest wages earned by any miners in the world. Years of active training had accustomed them to every detail of their work, and they executed all orders with the promptness and certainty of a veteran regiment in drill. As they stood in lines at the shaft-mouth, holding tin lunch-pails or lanterns, and waiting their turn to descend in the cages, there was little, it is true, to remind one of martial files: sturdy figures all, but many slouching and ungainly; straggling lines, except when the cage was at the surface, then closely joined, with bodies pressing against one another; no uniform dress, though commonly rough circular jackets or ragged coats stained and smeared with clay, loose woolen shirts, blue duck overalls wrinkled and dirty, heavy, shapeless brogans, and coarse felt hats, spotted, and gaping with rents through which wisps of stiff hair often protruded. Beneath these disfigurements the true proportions of the stalwart shapes were hidden, though the broad-jointed, sinewy hands which grasped the pails, and the short bare necks supporting the heads firmly, were unmistakable evidences of their manly vigor. When a cage reached the surface the waiting men took their places silently on the iron gratings which divided its interior into compartments or "decks." Some gripped a round bar above their heads to secure their foot-hold, but most were content to cling to the close-packed bodies of their companions. On the warning stroke of a bell the laden cage dropped swiftly down the dark shaft, passing station after station with their flickering lights and busy sounds, until the appointed stopping-place was reached. Then they passed out from the station through connecting galleries to their posts of work. In the hot levels all clothes were laid aside except a simple waist-cloth, and shoes which protected the feet from the scorching rocks. Thus stripped to the skin the slouching forms seen above were scarcely recognizable. Balanced alertly on wet, crumbling heaps of ore, with muscles swelling like flesh waves at every swing of the well-balanced picks, they became models for a sculptor. Their hot blood glowed beneath a skin whitened by a life in dark rock-chambers often dripping with water and reeking with vapor. Ridges of sweat stood on their broad backs or slid over their slippery flesh to the cloth rims about their waists. The variety of their motions had made them a troop of athletes. Swinging picks, hammering drills, shoveling ore, pushing loaded cars, mounting ladders from crib to crib, carrying heavy timbers and raising them to place—these and other duties developed their muscles from head to foot as in an underground gymnasium. As one looked upon this swarm of human ants, stoping out and sending up ore from a bonanza whose riches were incalculable, while the vault of the great mine echoed with busy sounds and sparkled with moving lights, it is scarcely surprising that the eyes were dazzled by the vision of the treasure-chamber and the brain heated by enkindled fancies.

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[1] The Big Bonanza, p. 324.

[2] Territorial Enterprise, March 15, 1876.

[3] Territorial Enterprise, November 28, 1877.

The mining editor of the Territorial Enterprise, one of the most experienced observers on the lode, wrote, in 1875, that there was not the slightest doubt that the bonanza would yield $34,000,000 a year for ten years at least.[1] The superintendent of the Consolidated Virginia Mine reported at the close of the year 1875 that the hoisting capacity of the mine would shortly be increased to 2,000 tons per day, by connection with a new combination shaft (Consolidated Virginia and California shaft), and that there was a sufficient supply of ore in sight to last for many years.[2] The Director of the United States Mint made a careful inspection of the ore-body, in company with Prof. Robert E. Rogers, in the summer of 1875, and fully indorsed the latter's estimate, "that with proper allowances the ore-body (in sight) equals an amount which, taken at the actual assays, would give as the ultimate yield of the two mines $300,000,000."[3] Others were even less guarded in their statements. Five or six hundred millions was a common estimate of the probable yield, and Mr. Philip Deidesheimer, a miner of 20 years' experience, reported, after a close personal survey, that the bonanza, in his opinion, would produce $1,500,000,000. It is true that this great body of ore was not within the limits of one mine alone, but extended north beyond the boundary-line of the Consolidated Virginia Mining Company into the section held by the original California Mining Company. To facilitate the work of exploration an arrangement was made in 1873 by which the entire section of 1,310 feet, lying between the Best & Belcher and Ophir mines, was divided into two portions; the southerly one, 710 feet in length, being held by the Consolidated Virginia Mining Company, and the northern portion of 600 feet being assigned to the re-incorporated California Mining Company. To compensate the stockholders of the Consolidated Virginia Mining Company for this cession of property seven-twelfths of one share of California Mining Company stock was paid as a stock dividend to each share of Consolidated Virginia.[1] The stock of each company was divided into 108,000 shares, whose par value was $100.

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[1] The Big Bonanza, p. 488.

[2] Superintendent's Report, Consolidated Virginia Mining Company, December 31, 1875.

[3] Report of R. E. Rogers, November 15, 1875, contained in Report of the Director of the Mint, 1875; pp. 19, 20, 83.

It was not surprising that the stock valuation of these two mines rose beyond precedent. The stock of the Consolidated Virginia Mine, which was offered at one dollar per share in July, 1870,[2] and even in June 1872,[3] could be purchased for $15 per share, gradually rose, though with marked fluctuations, from the time of the discovery of the first ore-body, in March, 1873,[4] until November, 1874,[5] when it was sold at from $115 to $176 per share. The following month was one of extraordinary excitement in the stock exchanges. The price of the shares bounded in a few days to $610, and even this point was passed during the first month of the new year, 1875, when shares were sold at $700,[6] and the market value of the mine was, therefore, $75,600,000. The fluctuation in the quoted value of the California Mine was even more marked. In September, 1874, its shares were selling as low as $37, but their value rose suddenly, in December, 1874, to $520, and reached $780 in the following month, thus placing a valuation of $84,240,000 on the mine.

In view of the apparent developments and the reports of expert examiners, even these extraordinary quotations seemed justified. For some months, at least, these high prices might have been sustained if the market value of other mines on the lode had not been blown up unjustifiably by the speculative mania, which was fanned to flame by true reports and wild imaginings. At a liberal estimate the actual capital available for mining speculation did not exceed $20,000,000, yet shares, whose aggregate value exceeded $50,000,000, were sold in one San Francisco mining stock exchange during the month of December, 1874,[7] and the market value of listed stocks alone, at the close of this year, amounted to several hundred million dollars. Even if the mines had been actually worth the price demanded, it would have been impossible to maintain such a ratio between the amount of available capital and the stock valuation; but many of the mines were not worth a dollar intrinsically, and all were overvalued. This was recognized as soon as the fever abated and men began to exercise ordinary judgment in their purchases. The natural decline was hastened by reports denying the extent and value of the new Comstock bonanza. The statements were unofficial and obviously partisan, but when buyers are becoming cautious and timorous, the most idle rumor may cause a panic. So in the present instance blind confidence was changed first to doubt and then to alarm within the same week. Stocks were thrown upon the market at any sacrifice. Shares of Consolidated Virginia fell from $700 to $497, and California Mine stock from $780 to $240, or to less than one-third of its former value. Ophir stock dropped from $315 to $100; Savage, from $190 to $85; Gould & Curry, from $72 to $40; and a corresponding decline of from 50 per cent. to 250 per cent. was suffered by nearly every mine on the exchange list, without any apparent reference to their situation.

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[1] Annual Report of the Consolidated Virginia Mining Company, 1877, p. 5.

[2] Daily Stock Report, December 22, 1879; Table of Rates for 1870.

[3] *Ibid.*, 1872. [4] *Ibid.*, 1873. [5] *Ibid.*, 1874. [6] *Ibid.*, 1875.

[7] San Francisco Stock Exchange sales aggregated $50,082,145; Commercial Herald and Market Review, January 14, 1875.

The great body of speculators saw their paper fortunes melt into thin air, and the most sanguine visionaries were ruined. Then, as it was natural to seek other scapegoats than personal folly and blindness, the men who had furnished extravagant estimates were bitterly reproached. In so far as willful exaggerations were made the censure was merited. Yet the reproaches were often palpably unjust. The most sanguine speculator, Mr. Philip Deidesheimer, staked all his property on the soundness of his judgment, and was made penniless by the panic.[1] Others less visionary made calculations which seemed to them accurate, but which were vitiated by unknown conditions. To measure the riches of a mine before the ore is wholly converted to bullion is a most difficult task. Mr. Mackey, a practical miner of the first rank, did not hesitate to declare it impossible, and has almost uniformly declined to hazard an estimate.[2] The presence of concealed masses of barren rock or horses in the midst of a vein, the unlooked-for termination of ore-bodies, the irregularities of their surface, the impossibility of obtaining samples sufficient to afford accurate conclusions by assay, and other obstacles which need not be cited, all militate against the certainty of the calculation. The safest plan is assuredly to make no positive assertions; yet the public demanded estimates and was not content with hypothetical conclusions, which alone could be furnished. They required impossibilities, for they would have found fault as sharply with undervaluation as they did with exaggeration. Unless, by a fortunate guess, the estimate was close to the truth as later demonstrated, the calculator might rely on a shower of abuse. Still, if he recognized this fact and remained silent his reticence would be misrepresented and censured. All mine officers were expected to tell stockholders and the public generally what they did not know themselves. Changes were occurring daily, and to describe them clearly and fully the daily bulletin must contain not only a report of progress but a complete résumé of previous reports. If the bulletins were technical summaries, many people could not comprehend their purport readily; if they were suited to the popular comprehension, they were called too vague and unspecific by speculators who were experts in mining. To satisfy everybody was impossible, and the mine managers had no uncurbed desire to satisfy anybody except themselves. Existing custom did not require full, clear, and prompt reports, and they had no ambition to figure as reformers. It should be noted, however, that they acted with exceptional fairness in permitting a thorough and general inspection of the bonanza during the period of the greatest excitement. Every applicant was not granted this privilege, or the work of mining would have been seriously impeded; but it is not known that admittance to the mine was ever refused to men of competence and character who had occasion to make the request as a favor or a right.[1] Visitors, who were daily in the mine, were, of course, permitted to draw their own conclusions and to express them as they saw fit. If the general opinion was incorrect it was not from lack of opportunity to form and modify a judgment. It is probable that no official reports could have been made which would have prevented the undue inflation of stocks. The will or whim of daring and wealthy speculators had power to affect the market prices far more than the best-attested valuation of the stocks in question. To men looking for satisfactory investments such valuations are essential, and the prices paid for mine shares will be based on such confirmed statements. To stock speculators accurate valuations are generally objectionable, as they tend to prevent stock-deals, which are their harvest. Now it was unfortunately true that, since the San Francisco Stock Exchange became one of the most flourishing institutions of that city, men began to buy mining stocks, as a rule, for speculative purposes, and not as an investment. A few prominent capitalists purchased the control of productive mines for the sake of dividends and the profits of milling ore, but the great body of holders bought their shares to sell at an advanced price. This gambling is as legitimate as any, and such stockholders have the same rights as those who hold stocks as a simple investment in productive property. No law which secures the rights of stockholders can question their intentions or discriminate between investors and gamblers. Legally, both classes stand on the same footing; practically, the rights of investors will be protected when those of gamblers are disregarded. This is simply because investors assert and maintain their rights effectively, while gamblers are too indifferent and reckless to protect themselves from imposition. Apparently they have been content to suffer mismanagement, unjust discrimination, and needless loss in the conduct of their property, because these were the natural excrescences of the system which alone could make preposterous stock-deals possible. When such men blame unfaithful stewards who fail to make full reports of the increase of talents intrusted to their keeping, their blindness or hypocrisy is evident. If false, misleading, or insufficient reports from official sources were forwarded from the Comstock Mines it was because such reports were more acceptable on the exchanges than plainly stated truths. Falsehood and ignorance offer a wider field for speculation than knowledge grants. The mining-stock boards of San Francisco had become gambling establishments of a low order. Suspicion was all-pervading and truth was hardly looked for, even in official bulletins from the Comstock district. The knowledge that the control of the leading mines had been suffered to pass into the hands of cliques, whose interests were presumably at variance, caused every statement to be regarded as partisan and prejudiced. The bulls pulled one way, the bears another. The most certain method of deceiving was to tell the truth, for the exact opposite would then be commonly believed.

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[1] Philip Deidesheimer; Record of Bankruptcy Sale.

[2] John W. Mackey.

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[1] The Big Bonanza, p. 473.

This was a miserable condition of things, but difficult to remedy. Speculation based on the probable productiveness of mines is one of the most useful forms of gambling; but speculation based on stock-deals is as unproductive as any banking game, and infinitely more destructive to the honor, humanity, and ordinary morality of a people. It saps insidously all distinctions of right and wrong, and success in money-getting soon becomes the only gauge of merit. So far as the Comstock Mines have furnished opportunities for stock-deals their discovery and development have been a curse to the Pacific coast, which all candid observers have recognized. The lode which was a boon to the thousands who found in it opportunity for persistent and useful work was also a bane to the thousands who converted it into an instrument for trickery and passionate gaming. What remedy could be given to men who did not wish to be healed? For such a poison a strong emetic was necessary, and this was administered frequently before the present partial cure was effected.

The stock-market panic of January, 1875, had no appreciable effect upon the development of the new bonanza; shares might fluctuate in value, but the ore-product continued to increase steadily. The following tables show the amount of ore extracted from the Consolidated Virginia and California mines during the years 1874–'78, inclusive, and the value of the bullion product:[1]

CONSOLIDATED VIRGINIA MINE.

YEAR.	AMOUNT EXTRACTED.	YEARLY BULLION PRODUCT.
	Tons.	*Dollars.*
1873	....	645,582.17
1874	91,168	4,981,484.05
1875	169,307	16,717,394.76
1876	142,679	16,657,649.47
1877	144,400	13,734,019.07
1878	122,831	7,996,753.11
TOTAL		60,732,882.63

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[1] Official Reports, 1874 to 1879.

CALIFORNIA MINE.

YEAR.	AMOUNT EXTRACTED.	YEARLY BULLION PRODUCT.
	Tons.	Dollars.
1873		
1874		
1875	5,123	* 453,060.46
1876	128,801	13,400,841.40
1877	217,432	18,924,850.27
1878	134,888	10,949,078.93
TOTAL		43,727,831.06

* Amount received from sale of ore January 18, 1876.

By this extraordinary output managers aimed to display, doubtless, the extent and richness of their ore-body in order to maintain at a high figure the market value of their mine shares. Great dividends, whether judiciously provided or not, were the most certain aids to this end, and the returns to stockholders during the years 1874–'79 were unprecedented. The stockholders of the Consolidated Virginia Mine received $42,120,000 from May, 1874, to August, 1879, and the California Mine paid $31,050,000 during a shorter period, May 15, 1876, to August 16, 1879. The hoisting machinery was so efficient and the extent of the ore-body so enormous that a force of 1,000 miners could be employed to advantage in 1877 by the two companies. The only limit to the production was the capacity of the several mills engaged in crushing and amalgamating, and it is probable that this was overtaxed with a resultant loss to the stockholders, which might have been saved by more economical management. The general demand for large and frequent dividends fully kept pace, however, with the spirit of the mine directors, and few stockholders had the right to complain that their protests were disregarded. As a body they have been as greedy as young ravens and fully as heedless, clamoring for dividends without questioning closely the methods of production. If, then, the work of reducing the ore was pressed too rapidly, the mine managers might urge with some force that their action was justified by the accord of the majority of the shareholders, and that mines are necessarily managed to satisfy owners and not economic theories. For the haste with which the ore was extracted no justification is needed. The crumbling and swelling masses of feldspar and clay were supported and braced by a forest of wooden props, which required constant change, refitting, and renewal, forced out of place by shifting ground and rotted by the intense heat and moisture. Rapid extraction of ore from such an insecure treasure-chamber was an economic necessity, and the work was winged by the ever-present fear of fire. If, by a moment of carelessness, a fire should be kindled in any quarter of this great tinder-box it would spread irresistibly, and even if a fearful loss of life did not ensue, a probable consequence, the conversion of the mine into a flaming pit and its final ruin would follow. The dread of this disaster kept the principal owner of the great bonanza sleepless for many a night and caused him to explore the levels anxiously when others with less at stake were quietly dreaming.[1] No conflagration blasted his hopes, but the immunity thus granted was due in all likelihood to the extraordinary precautions and vigilance of the mine managers, who did not relax their careful oversight until the treasure-chamber was fairly emptied.[2]

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[1] John W. Mackey.

[2] The fires which broke out subsequently in the abandoned levels of the California and Consolidated Virginia mines showed the value of these precautions, for, though discovered shortly after their outbreak, they could only be extinguished by bulkheading all connecting drifts and allowing the wood to smolder till it was wholly consumed or ceased to burn from lack of oxygen. Report of James G. Fair; Territorial Enterprise, May 4, 5, 6, 1881.

CHAPTER XVII.

FEATS OF LABOR.

The discovery and development of this bonanza undoubtedly gave a new lease of life to the mining industry of the lode, and a second service of scarcely less moment was meanwhile rendered by the same agency. The demand for pure water became yearly more pressing. The two water companies endeavored vainly to satisfy it. The range above the level of the lode towns had been nearly drained, and only a few rivulets of water still trickled from the mountain sponge. The bilge-water, so to speak, of the mine levels was used as a last resource, but this was impure and nauseating. It was evident that an extraordinary effort must be made to secure water from some unfailing source; but when the plan was broached of conducting water from a sierran creek across Washoe Valley, even the boldest speculators were startled. To bring water from any point twenty miles distant entails a considerable expense; to construct a flume-line fourteen miles in length was practicable, though costly, but this work was only the prelude to the real task. A flume four miles long would conduct the water from Hobart's Creek to a spur from the main Sierras at a point 1,950 feet above the level of Washoe Valley. From this elevation it was necessary to lead the water across the valley to a distributing reservoir in the hills of the Virginia Range, seven miles distant. In its passage the water must be allowed to fall nearly 2,000 feet (1,961 feet) to the bottom of the valley, and then be lifted 1,496 feet to the summit of the dividing ridge, on whose eastern slope the cities of Virginia and Gold Hill were built. How to accomplish this task most effectually and cheaply was an unsolved problem in hydraulics. To pump the water from the valley to a reservoir in the Virginia Range was probably feasible, but the first cost of the requisite machinery and the operating expenses would be inadmissibly great, and another device must be employed. The best engineering talent on the Pacific coast was interested in the solution of this difficulty, and after anxious consideration it was finally proposed, by Mr. Henry Schussler, to carry the water across in an iron pipe, constructed in the form of a gigantic letter U, though necessarily irregular in outline.

Mr. Schussler was the engineer under whose supervision the Spring Valley Water Works of San Francisco had been constructed, and his plan, though a daring conception, was theoretically feasible. At the lowest point in the conduit-line, as determined by survey, the pipe would be subjected to a perpendicular pressure of 1,720 feet of water, equal to a pressure of 800 pounds upon every square inch of its inner surface. To join, hermetically, iron pipe-sections of twelve inches interior diameter which could bear this enormous strain without leaking or bursting was a necessary condition of success in the plan. The total length of the pipe would be 38,300 feet, and every section must be made to fit a predetermined place in the line.

When the scheme of the new line of water works was submitted to the controllers of the Comstock Lode its practicability was gravely doubted. "Everything can be done now-a-days," said Mr. Flood, finally; "the only question is—Will it pay?"[1] The temper of the bold speculators of the Pacific coast has never been more concisely shown forth than in this half-jesting speech. Prospective profit has been the main touchstone of enterprises, and great risks have not deterred them from expending millions in mine lotteries and other ventures when great prizes might be won. The relative promise of such investments will be differently estimated, of course, and one speculator will undertake what another equally venturesome has declined to attempt.

A second Virginia and Gold Hill Water Company was incorporated under the laws of California in 1871, which purchased all the rights and franchises of the first-named company. Mr. Sharon sold the stock which he held in the new company before the plan of Schussler was executed, while Mr. Flood bought stock in the same company and urged forward the projected works to completion.[2] The pipes for the Washoe Valley line was ordered in 1872, and the first section laid on the 11th of June, 1873. The sections were made of wrought-iron from $\frac{1}{16}$ to $\frac{5}{16}$ of an inch in thickness, and were 26 feet in length, with riveted seams. Over every joint in the pipe was placed a cast-iron sleeve or band, and the intervening space packed with molten lead, and before the sections were laid in place they were dipped in a hot-bath of asphaltum and coal-tar. Thirteen deep gulches lay in the course of the pipe, which crossed them by as many bends, winding about also in lateral curves past hills and jutting rocks. These irregularities of outline made the work exceptionally difficult, as the pipe was laid at the depth of four feet beneath the surface throughout its entire length of 38,300 feet;[1] still the last section was joined on the 25th of July, six weeks after the work was begun.

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[1] J. B. Overton, Superintendent Virginia City and Gold Hill Water Company.

[2] J. B. Overton.

When the pipe had been carefully tested by graduated hydraulic pressure up to 1,850 feet of perpendicular water column, and a few necessary repairs had been made, the water was allowed to flow through to the flumes which supplied Virginia City and Gold Hill. A fire kindled at the inlet of the pipe, August, 1873, was the sign of the entrance of the flood. At various points along the line 26 cocks had been inserted to clear the pipe of sediment and to allow the escape of compressed air. So when the current surged through the pipe the cocks on the crests of the ridges screamed like steam-whistles with the rush of the escaping air. Thus a signal of the approach of the water passed along the line, and the expectant people in the Washoe cities waited impatiently for the coming of the promised stream. After an anxious interval a beacon-fire was seen above the cities on the summit of the dividing ridge. The water had reached the end of the pipe and the success of the work was assured. Then a mighty shout went up from the assembled people in the city, and when the foaming stream leaped from the flume upon the dry and rocky bed of Bullion Ravine it was hailed as a deliverance from the pains of thirst and sickness. "The crowd were as wild with joy as the Israelites when Moses smote the rock," declared a spectator with pardonable extravagance.[2] Men rushed forward to dip their hands in the stream and fill bottles with the turbid water. It was unfit to drink at first, as a quantity of loam, saw-dust, and bran had been sent down in order to fill up the cracks in the flume, but soon it gushed forth in a clear, pure stream, which ran down into Gold Cañon, following the course of the dry creek. Fireworks, bonfires, and cannon discharges saluted its appearance, but the thronging company, who drank eagerly of its sweet water and listened in delight to the sound of its plashing on the hot rocks, was the most certain assurance of the great need which it supplied.

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[1] Records of the Virginia and Gold Hill Water Company, furnished to United States Census Agents, 1880.

[2] Territorial Enterprise, August 2, 1873.

The capacity of the pipe was 2,200,000 gallons daily, and the supply furnished to Virginia City and Gold Hill was about 2,000,000 gallons every 24 hours;[1] but the demand increased with the supply, and in 1875, although the quantity used by the towns on the lode was many times greater than that obtained two years before, the people still called for more. The outbreak of a great fire made this demand imperative.

On the morning of the 26th of October, 1875, a coal-oil lamp was upset in a little lodging-house of Virginia City and flames filled the house in a moment. Fanned by the wind, they leaped from roof to roof until the whole quarter was on fire, and the imminent peril of the city was seen. Bells rang out the alarm with their sharp, startling clangor, and steam-whistles blew ear-piercing blasts, sounding above the crackling of the flames, the shouts of the firemen, the cries of escaping women and children, and the rattling of engines and cart-wheels. Lines of hose were quickly attached to the hydrants, and engines began to throw water upon the fire; but the firemen might as well have attempted to quench a volcano. No rain had fallen for several weeks, and the wooden dwellings were dry as tinder. In most of them the only partition between adjoining rooms was a sheet of cotton cloth stretched tightly from floor to ceiling, and covered with paper almost as inflammable as the mimic walls of stage scenery. Tongues of fire licked up walls and ceiling in a moment, and the inmates had barely time to escape alive, without thought of saving their household effects. The water head was entirely insufficient, owing to the lack of suitable pipes and the failure of the aldermen to contract for a more adequate water-supply; consequently, when an engine hose was connected with the service-pipe, only a scanty stream would be thrown upon the fire; still the flames raged with such fury that it is doubtful whether any possible resource would have checked their spread. The brick buildings of the city withstood the fire at first, but their walls soon crumbled upon the surrounding ruins; the church spires flashed up suddenly like signal fires and burned like torches above the enveloping smoke, while strong whirlwinds swept up still higher fiery pillars of eddying sparks. A fierce gale, blowing from the west, urged the flames down the mountain slopes through the heart of the city, hurling the flimsy room-walls in blazing sheets through the air far in advance of the fire-line, and bombarding the house-tops with a fiery hail of cinders. Roof after roof would thus blaze up behind the opposing ranks of the firemen, until they were hemmed in between two walls of fire and forced to yield the street, and re-form farther down the slope. With every foot thus gained the fury of the fire seemed to increase; flame-spires darted from its blazing front like blasts from a myriad of blow-pipes, and the very air seemed on fire to the eyes of the startled people. A natural panic seized them, and with one accord men, women, and children fled before the flames, carrying in their hands the things they most prized, and only halting when far out beyond the city on the open face of the mountain. Then they looked back and saw their homes transformed into a reeking furnace—"a sea of fire," said one observer, "with great billows tossing to and fro."[1] Over all rested a heaving mass of smoke, rent momently by whirling pillars of flame, ascending so high in air that their tops were visible from the base of the Sierra Nevada Mountains, fifteen miles distant.

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[1] Territorial Enterprise, August 17, 1875.

Though the city was thus deserted as doomed, the costly mine-works were not yet abandoned. When it was seen that the business quarter could not be saved redoubled efforts were made to preserve the mine and mill works on the line of the lode, and every one of these buildings in the path of the fire was the centre of a desperately stubborn contest. The miners had formed cordons about the shafts at the first serious alarm, checking the onset of the flames with every resource at command. The hill basin and cañon echoed with repeated blasts of dynamite leveling outhouses and surrounding dwellings; but the fire overleaped the circle thus cleared, or flashed along the ground among the fallen ruins. Miners and firemen, contending obstinately with water-buckets and wet blankets, beating and trampling out the flames when water failed, were driven back foot by foot; and at length the greedy fire seized upon the great shaft-houses and burrowed among the surrounding stacks of cord-wood and timber. Almost instantly masses of pitch-black smoke covered the burning piles, riven by red flashes and volleys of glowing sparks, and then a mighty outburst of flames roared upward with an intolerable glare and heat. At the Ophir Mine works alone 1,000 cords of wood and nearly 400,000 feet of mining timber and lumber were on fire,[1] and a bonfire of more than a million feet of lumber blazed beside the works of the Consolidated Virginia Mining Company.[2] So intense was the heat that railroad car-wheels were smelted in the open air near the Ophir works,[3] and it seemed as if salamanders alone could breathe in the stifling atmosphere; yet, after the shaft-house was a blazing ruin, when it was discovered that the flames were creeping down the shaft, lines of men stood in the midst of the burning mass, passing water-buckets from hand to hand with which to quench the fire, for the timbers of the heavy gallows-frame had fallen upon the earth-covered platform which was constructed to protect the shaft-mouth and broken through into the shaft. Until midnight this hand-to-hand fight was maintained, when the help of the fire-engines was at length obtained, and a stream of water was poured down the shaft for thirty-six hours continuously. By this unremitting exertion the downward progress of the fire was stopped at a point 400 feet from the surface. The mine was saved, but the surface works, covering an area of 39,522 square feet, and completely supplied with machinery, were burned to the ground.[4] The Consolidated Virginia Mining Company's hoisting-works and mill and the California Company's mill were likewise destroyed, with a resultant loss to these companies of $1,311,000.[5] Fortunately, the buildings of their new joint shaft, the most costly on the lode, were saved by the strenuous exertions of the working miners and the well-directed use of giant-powder in blowing up the neighboring houses. With this exception the fire swept unbaffled across the city; the business quarter was utterly ruined; 2,000 buildings were burned to the ground; property to the value of $10,000,000 was destroyed, and hundreds of persons were made homeless and destitute.[1]

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[1] The Big Bonanza, pp. 557–562.

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[1] Annual Report, Ophir Mining Company, 1875, p. 11.

[2] The Big Bonanza, p. 563.

[3] Annual Report, Ophir Mining Company, 1875; Superintendent's Report, p. 11.

[4] Annual Report, Ophir Mining Company, 1875, pp. 11, 12.

[5] The Big Bonanza, p. 563.

Such a calamity is most deplorable, yet not without a bright side. The sympathy shown to the people of the city and the marvellous energy with which the ruin was repaired are memorable. The towns of Nevada and California contributed as with one impulse to relieve the distress of the sufferers, and as soon as supplies could be forwarded none were allowed to want for food, shelter, and clothing; nor was this heartfelt liberality undeserved, for none were willing to impose upon the charity of their neighbors. The working-classes of Virginia City have an honorable pride which detests the condition of a sluggard or a pauper; all were anxious to gain their living by work, and there was work for all. The business men of the city did not lose heart, and the rebuilding of the town was determined upon while the ruins were still blazing. On the morning after the fire the smoking timbers and débris were cooled by buckets of water and streams from the hydrants in hundreds of places, and the lumber which came in by rail was placed on the reeking ground. The work of building then went on continuously all day long and far into the night, in the midst of storms as well as in fair weather. A tornado blew down a large part of the newly-erected houses during the week after the fire, but the wrecks were cleared away as soon as the storm ceased and building was resumed. Sixty days after the fire the principal streets running through the burnt district were lined with business houses, the majority of which were of a better class than those destroyed, and habitable dwellings covered the intervening blocks.[2]

The achievement of the mining companies whose works were burned was even more extraordinary. The official report of Samuel T. Curtis, Superintendent of the Ophir Mining Company, is characteristic: "On the day after the fire competent men were dispatched to the lumber-yards of

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[1] The Big Bonanza, p. 557.

[2] The Big Bonanza, pp. 562, 563.

Carson and Dutch Flat, Cal., to procure and ship timbers; machinery was telegraphed for; the new double-reel hoisting-engine and cables just completed for the combination shaft of the Chollar-Potosi, Hale & Norcross, and Savage secured; and, through the heaviest storms which Virginia has seen for years, the old engine foundations were torn out and new ones to suit the combination-shaft engine constructed; work was prosecuted without cessation; supplies hauled a considerable distance on account of the destruction of the railroad tunnel and bridges; the works rebuilt and work through shaft resumed November 25th, being inside of 30 days from time of destruction. While the reconstruction of works was going on a donkey-engine, furnished through the kindness of the Phil. Sheridan Mining Company, was put in place, with which we were enabled to retimber shaft where it had been burned to a depth of 400 feet from surface, besides hoisting considerable water entering on the 700-foot level of mine. The buildings rebuilt have been made much larger and more complete and convenient than formerly.[1]" On the 15th of December the inventory of the buildings and machinery of the Ophir Mine works showed an aggregate value of $317,811.57, a simple but expressive record.[2]

Work was pressed with equal energy by the managers of the Consolidated Virginia Mining Company, and within 50 days the hoisting-works and ore-house were rebuilt on an enlarged scale, with many improvements, and ore was raised at the rate of 600 tons daily from the shaft.[3] The buildings and machinery at the mine-shaft were valued at $300,000 on the 31st of December, 1875.[4]

Professional pride and the desire to bolster up a sinking stock market were probably the main incentives to this unprecedented feat in mining industry. These motives may be called selfish, no doubt, but the enterprise, energy, and skill shown in the work merit recognition nevertheless. Only invincible prejudice will see nothing to praise in the conduct of mining enterprises by the men who have controlled in succession most of the productive and barren mines of the Comstock Lode, for faith, industry, skill, perseverance, and zeal are exhibited in the development of the lode by works which form an unimpeachable record. It is true that the bonanza mine managers have received, in various ways, the lion's share of the profits from the ore extracted; they have held the greater portion of the shares of the bonanza mines, and have made large gains as mill-owners. If any of their acts in acquiring fortune have been illegal, measures can be taken by those aggrieved to obtain restitution; and a decision in a recent suit would indicate that their official acts cannot always be justified. The truth of the main charge against them is admitted—that, while serving as trustees of mining companies, they made contracts for crushing the ore of these companies with themselves as mill-owners.[1] If this is illegal they have broken the law. In so doing, however, they have followed notorious precedents, and in so far can plead custom; if not justification. They maintain, also, that the ore was reduced at the regular market rates for milling, and more efficiently than it could be milled otherwise; for they did not judge it expedient to erect corporation mills, but awarded the contracts to the most capable agents, who, by a fortunate coincidence, were the grantors themselves. This is scarcely a modest claim, but it may, nevertheless, be a true one; for their competence to superintend mills as well as mines is undeniable. The percentage of the assay value of the ore returned to the mine stockholders by their mills was certainly not below the average, and the ratio of profits to working expenses attested their skillful management of the mines. This much may fairly be said in palliation of their action; but this is not a justification of their course. Trustees of a mining company who considered the company's interest before their own would have erected corporation mills, or awarded contracts for milling to the lowest responsible bidders who would guarantee the best returns. In this way the profits gained by the mill-men might have been saved to the stockholders, or the market rates reduced by competition, to their evident advantage; but this would be a nearer approach to an ideal management than has been attempted at the Washoe mines. No measures have been adopted to secure unselfish and unbiased trustees, and it is therefore impossible to contrast the two theories of management by practical results. Whether such officials exist, except in Utopia, is gravely questioned in Nevada, and this doubt may be justified; but it is certain that no well-directed attempt to discover them has yet been made. Owing to causes before noted the rights of stockholders have never been fully defined, asserted, and maintained in the Comstock Lode district. The controllers of the bonanza mines have shown neither more nor less than the ordinary measure of regard exhibited by directors for the interests of stockholders, and if they have not been reformers or champions neither have they been infringers upon any conceded rights. The ore was extracted and reduced swiftly and skillfully, and unexampled dividends were paid to the mine stockholders until the ore deposits were nearly exhausted; and if the managers had the lion's share of the profits, they had also the lion's share of the risk and labor. These facts should be borne in mind in any fair criticism or censure of their conduct as trustees.

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[1] Superintendent's Report, Ophir Mining Company, 1875; Annual Report, p. 12.

[2] Annual Report, Ophir Mining Company, 1875, p. 21.

[3] Annual Report, Consolidated Virginia Mining Company, December 31, 1875, p. 10.

[4] *Ibid.*, p. 13.

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[1] Testimony of James C. Flood, President of Consolidated Virginia Mining Company; Stenographic Report in suit of George C. Kinney *et al.* *vs.* Consolidated Virginia Mining Company, p. 190.

Their services in pressing the development of the mines and in maintaining the prosperity of the towns on the lode cannot be questioned. The swift rebuilding of the burned city and the renewal of work in the mines was due in large measure to their energy and faith; nor did they rest content with this service. To provide against the recurrence of such a calamity was their next thought. Although the full supply of water available for fire-service had not been used at the outbreak of the fire, owing to the lack of suitable pipes and the disagreement between the city government and the water company, yet it was evident that the supply so far obtained was inadequate. Hobart Creek, in the Spring months, could furnish from 25,000,000 to 40,000,000 of gallons daily; but it was not possible to store up the overflow, and during the Summer the supply steadily diminished until, at the end of October, only 700,000 gallons could be drawn daily from the creek. The cost of the water-works had been $725,000, but twice this sum must be expended upon the proposed extension; a tunnel 4,000 feet in length must be cut through a dividing ridge in order to bring water from a lake in the Sierra Nevada Range for the use of the mine; a second line of pipe must be laid across Washoe Valley, and an expensive dam constructed in the basin of the lake to increase its area and depth; yet the necessary outlay was made without hesitation. A dam was built across the outlet of the lake (Marlette) 170 feet long, 37 feet high, and 88 feet wide at the base, increasing the area of the lake to 1½ square miles and its average depth to 12 feet. A flume 26,400 feet in length conducted the water of the lake to the entrance of the tunnel, which was cut through the separating ridge a distance of 3,994 feet.[1] From the mouth of the tunnel a second flume line, 34,320 feet in length, was built to the inlet of the pipe through which the water passed across Washoe Valley to the Virginia Range. The ground for the bed of this pipe had been broken six months before the fire, May 1, 1875, and it was quickly and skillfully laid under the supervision of its designer, J. B. Overton, superintendent of the water company. It crossed the valley near the line of the first pipe, constructed in 1873, which it resembled in general design, though differing in important details.[2] It was 600 feet shorter and its interior diameter was 2 inches less. The sections were of wrought-iron, 16 feet in length, and ¼ of an inch in thickness; the seams were lap-welded and the joints screwed together, the cast-iron sleeves and packing being discarded. From the outlet of both pipes the water passed in a flume to a storage-reservoir 18,480 feet distant, from whence a flume line, 34,320 feet in length, conducted it to the point of distribution in Virginia City. The capacity of the storage-reservoir was 8,300,000 gallons, and another reservoir, constructed to hold 3,400,000 gallons, was placed on the dividing ridge between Virginia City and Gold Hill.

To protect the city in case of fire pipe-lines, aggregating 4 miles in length,[3] were laid through its streets, and hydrants constructed at suitable points. This pipe is the property of the city, which also owns 2½ miles of smaller supply-pipes. The length of the pipe-lines belonging to the water company which run through the streets of Virginia City, Gold Hill, and Silver City is 14 miles, and through this system of pipes and flumes 4,200,000 gallons of water are distributed daily through the towns on the lode, the mine-works consuming two-thirds of the supply, or about 2,800,000 gallons every 24 hours. The water-rates in 1880 were 20 cents per 1,000 gallons to the mining companies and $4 per month to families of six or eight persons. As the full supply which can be furnished is taken at these rates, the income of the company is evidently large; still, its charges cannot be deemed exorbitant in view of the fact that the cost of its plant, including flumes, dam, reservoirs, pipes, water-rights, litigation, &c., was $2,200,000.[1]

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[1] Territorial Enterprise, May 15, 1877; Connection between two headings made May 13, 1877; Dimensions of the tunnel: 8 feet high, 6¼ feet wide at floor-level, 5¼ feet wide at roof; as timbered, 7 feet high, 6¼ feet wide at floor level; 4½ feet wide at roof.

[2] J. B. Overton, Superintendent Virginia City and Gold Hill Water Company

[3] Interior diameter for 2¾ miles, 10 inches; for 1¼ miles, 8 inches.

Besides supplying water to the mining towns a considerable amount of ice, ranging from 3,000 to 4,000 tons annually, is furnished to consumers by the water company, who cut it on their reservoirs in the Virginia Range. To meet the demand, when the Virginia and Truckee Railroad Company persisted in maintaining a high rate of freight charges for ice transportation from Carson Valley, the water company made full preparations to manufacture ice artificially to the amount of twenty tons daily; but a compromise with the railroad company made the investment useless. In 1880 the price of the reservoir-ice delivered to the consumer was $20 per ton.

While the Virginia and Gold Hill Water Company were piercing the sierran ridge to obtain water, the Sutro Tunnel Company were persistently advancing their great adit in order to rid the mines of its presence. The distance from the mouth of the tunnel in the foot-hills of the Virginia Range to the Comstock Lode was 20,000 feet[2] in round numbers, or nearly 4 miles. The height of the passage-way was at first 10 feet, and its width 13 feet 6 inches, though the actual dimensions of the excavation were somewhat greater, as it was necessary to timber many sections comprising 45.5 per cent. of the total length, 20,489 feet, as finally completed.[3] After reaching a point 1,100 feet from the mouth, the tunnel was driven 5 feet wide by 6 feet high[4] in the clear.[5] It was planned to sink four ventilating and working shafts at intervals of from 4,000 to 5,000 feet on the line of the tunnel, so that the work of excavation might be carried on simultaneously at a number of headings. As soon as the requisite capital was obtained, through Mr. Sutro's exertions, as related in a former chapter, a large force of miners began to carry out the design as rapidly as their services could be utilized.

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[1] J. B. Overton, Superintendent Virginia and Gold Hill Water Company.

[2] Twenty thousand feet on the north side of tunnel, and 19,987 feet on the south side; George J. Specht, C. E., Sutro Tunnel Company.

[3] George J. Specht, C. E., Sutro Tunnel Company. [4] *Ibid.*

[5] Enlarged during the months February–September, 1876, to comply with the specifications of the tunnel franchise (Act of Congress approved July 26, 1866) calling for an area not less than 8 by 8 feet.

In estimating the practical service of the tunnel to the mines on the lode the length of time required for its completion was a most important consideration. In the contracts with the mining companies the Sutro Tunnel Company did not bind itself to complete the work within any specified time, and the Sutro Tunnel act of 1866 did not include any time allowance or limitation. The company simply covenanted to prosecute the work continuously, except from unavoidable accident, and to expend a minimum sum yearly after the first day of August, 1868; but it was generally understood that the time required to make the tunnel serviceable would not exceed five years,[1] and the Sutro Tunnel Commission, in 1871, when only one-tenth of the total length had been cut, estimated that the main tunnel could be completed by manual labor alone in three and one-fourth years after the work had been fairly undertaken in accordance with the original plan. If this estimate had been even approximately correct, there is no doubt that the practical utility of the tunnel would have been materially increased; but the estimate was vitiated by an unforeseen yet very probable occurrence. The calculation was based on the plan of extending the tunnel by working through the four shafts on its line as well as at its face. In this way the work of excavation could have been carried on at nine distinct stopes or headings east of the lode from which a connecting gallery might also have been cut. The sinking of these shafts was duly undertaken, in accordance with the terms of the contract, but before the two nearest the lode had been half completed such floods of water poured into the workings that their further extension was judged to be a practical impossibility. The other two were cut to the tunnel level, but the workmen were driven by a flood from the extension of one less than three months after its completion. Consequently the work was chiefly carried on by the excavation of the main tunnel alone and its progress was inevitably slow.

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[1] Report of Committee of the Mechanics Institute of San Francisco, in 1867. Estimate: "Three and one-half years, allowing for all contingencies." Estimate of R. G. Carlyle, Chief Engineer in employ of Sutro Tunnel Company: "Two years six months and twenty-one days."

In 1873, when the work was continuously prosecuted and the best result of hand-drilling obtained, the advance was 1,919 feet,[1] at which rate more than seven years would have been required to complete the tunnel; nor is it probable that this rate could have been maintained by manual labor, owing to the extraordinary increase of heat and the necessarily defective ventilation. Furthermore, during a part of the year 1873 work was carried on by headings from shaft No. 1 as well as at the main tunnel face, thereby increasing the normal rate of progress 650 feet.[2] In view of these facts it does not appear probable that the tunnel could have been completed before 1885, if hand-drilling alone had been relied upon; yet when the original calculations were made by the Sutro Tunnel Company machine-drilling was in its infancy and its practical serviceability not yet fairly demonstrated. The drills in use were of complicated construction and constantly requiring repairs. The Sommeiller drill, at the Mont Cenis Tunnel, could rarely bore to the depth of a foot without refitting, and to provide sixteen serviceable machines two hundred were kept in the repair shops.[3] The cost of their use was computed to be two and a half times the cost of hand labor, which offset the advantage of an increased rate of progress.[4] In the employment of the Burleigh drill, at the Hoosac Tunnel, better results were attained, but the average endurance of a machine without repair was only five days,[5] and even as late as 1869 the number of drills in the repair shops was double the number of those in use at the west heading of the tunnel.[6]

If, then, the length of time requisite to complete the tunnel by manual labor is considered, and if the extraordinary cost of this service, owing to the heat and foulness of the atmosphere at the face of the heading, is duly estimated, it may be seriously questioned whether work in the tunnel would have been prosecuted at the present day except for a fortunate coincidence. This was the opportune improvement of the power-drills, whose use in the tunnel averted the failure of the project, though the original plan was abandoned. On the 25th of April, 1874, the first

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[1] George J. Specht, C. E., Sutro Tunnel Company. [2] *Ibid.*

[3] Report of United States Commissioner of Mines and Mining, 1869, p. 514.

[4] Proceedings of Institution of Civil Engineers of Great Britain, vol. XXIII, p. 258, vol. XXXVI, p. 1.

[5] Report of United States Commissioner of Mines and Mining, 1869, p. 508.

Burleigh drill was put in operation at the face of the heading,[1] and before the middle of August, 1874, four machines were at work constantly. Their superior efficiency, as compared with the plodding hand-drill, was evident at once. In September, 1874, the advance made was 310 feet, nearly three times the distance cut during the previous March (130 feet), the last month in which hand-drills were exclusively used. This rate of progress was steadily maintained, 417 feet being cut in December, 1874, through rock of favorable character, hornblende andesite, requiring only partial timbering, which may be fairly contrasted with the advance of 151 feet, made by hand-drilling in September, 1873, in rock of similar character, the best result recorded. Furthermore, the height and width of the heading-face had been increased, as soon as machine-drills came into use, to 9.5 feet and 13 feet, respectively, outside of timbers,[2] so that the actual excavation per lineal foot of advance was more than double what it had been during 1873. During the years 1875 and 1876, 7,398 feet were cut by the aid of Burleigh and Ingersoll drills through rock of nearly uniform composition, augite andesite (triclinic feldspar and augite) mainly, showing an average monthly advance of 308 feet 3 inches.[3] Such

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[1] Then 5,850 feet from the mouth of tunnel; George J. Specht, C. E., Sutro Tunnel Company.

[2] George J. Specht, C. E., Sutro Tunnel Company.

[3] The monthly average advance of the main tunnel heading of the Rothschönberger Stollen (excavated from the mouth), the longest adit in the Freiburg District,[1] was 26 feet 6 inches, when hand labor and black blasting-powder were used.[2] A few months before its completion (opened April 12, 1877) power-drills were used, and the average monthly advance was increased to 84 feet. Its face area is 3 square metres, or 96 square feet,[3] one-fifth less than the face area of the Sutro Tunnel, 123½ square feet, as cut in 1875, and nearly twice the area cut in 1873 (7 by 8), 56 square feet, approximately. Consequently the comparative record of progress is, viz:

Character of rock.	Monthly average advance. By hand labor (single heading). Lin. ft.	In.
Sutro Tunnel. Augite andesite; hornblende andesite (1873)	105	9
Rothschönberger Stollen. Gneiss	26	6

Character of rock.	By power-drills. Lin. ft.	In.
Sutro Tunnel. Augite andesite; hornblende andesite (1875)	310	8
Rothschönberger Stollen. Gneiss	84	0

Cubic feet of rock excavated monthly by hand labor:	
Sutro Tunnel	5,922
Rothschönberger Stollen	2,544
Cubic feet of rock excavated monthly by power-drills:	
Sutro Tunnel	38,367½
Rothschönberger Stollen	8,064

The advance in linear feet is, of course, a better measure of efficiency than the quantity of rock quarried, as increased area of face permits the employment of additional laborers or drills.

[1] Thirteen thousand nine hundred metres—45,600 feet in round numbers.

[2] Prof. R. W. Raymond, Engineering and Mining Journal, November 3, 1877.

[3] Engineering and Mining Journal, October 27, 1877.

a record was without precedent in the history of tunneling in mining districts. The favorable character of the rock excavated may, in a measure, account for it; but due credit should be given for the singular energy with which the work was pushed and the skill with which the drills were operated.

Sutro's untiring zeal kindled a like spirit in his co-workers. Changing shifts urged the drills onward without ceasing; skilled timberers followed up the attack on the breast and covered the heads of the assailants like shield-bearers. The hot rocks blown from the face of the heading hardly ceased rattling on the floor of the tunnel before they were thrown and shoveled into iron tram-cars and borne away by mule-trains. Lanterns bound to the shoulders of the mules threw straggling rays of light on the dark pathway; the dripping walls and roof reflected the beams through a myriad of water-prisms, and streaks of mottled gray, green, and black rocks shone out at intervals with vivid distinctness, as if illuminated by lightning flashes. A foreground and background of utter blackness inclosed the moving cylinder of changing lights and shadows, a fitting frame-work to the weird picture. As the train neared the mouth of the tunnel it was seen first as a line of dancing lights; then the tinkle of collar-bells was faintly heard and the tramping of hoofs on the rock floor. The light specks swelled to clearly-shining stars and then shrunk to red points in the glare of the sun-rays which transformed the roughly timbered entrance into a white-pillared corridor. In this transfiguring light the eyes of the mules glowed like carbuncles, which shone in their dark setting till the animals, with quickening steps, passed through the gleaming archway into the open sunlight. The dump at the mouth of the tunnel grew rapidly to the proportions of an artificial plateau raised above the surrounding valley slope; yet the speed of the electric currents which exploded the blasts scarcely kept pace with the impatient anxiety of the tunnel-owners to reach the lode when the extent of the great Consolidated Virginia bonanza was reported; for every ton raised from the lode before the tunnel cut it was a loss to them of $2, as they thought. Urged on by zeal, pride, and natural covetousness, the miners cut their way indomitably toward their goal, though at every step gained the work grew more painful and dangerous. The temperature at the face of the heading had risen from 72° Fah. at the close of the year 1873 to 83° during the two following years; though, in the summer of 1875, two powerful Root blowers (No. 4) were constantly employed in forcing air into the tunnel. At the close of the year 1876 the indicated temperature was 90°, and on the 1st of January, 1878, the men were working in a temperature of 96°.[1] In spite of the air currents from the blowers the atmosphere before the end of the year 1876 had become almost unbearably foul as well as hot. The candles flickered with a dim light, and men often staggered back from their posts faint and sickened. Behind the workers were sections of treacherous ground—crumbling rock and swelling clay—which occasioned constant dread lest some day the overstrained props might give way and a falling mass crush the air-pipes and block the passage. In such event the men might die for lack of air in the narrow tomb before they could cut their way through the barrier or be rescued by outside help. This was not a fanciful peril, as it was averted more than once by the watchfulness and promptness of the miners in propping up sinking ground and piercing the fallen debris.[2] During the months immediately preceding the junction with the Savage Mine works the heading was cut with almost passionate eagerness. The miners were then two miles from the nearest ventilating shaft, and the heat of their working chamber was fast growing too intense for human endurance. The pipe which supplied compressed air to the drills was opened at several points, and the blowers were worked to their utmost capacity; still the mercury rose from 98° Fahr., on the 1st of March, 1878, to 109° on the 22d of April, and the temperature of the rock face of the heading increased from 110° to 114° during the same period. From the 1st day of May, 1878, it was necessary to change the working force four times a day instead of three,[3] as previously, and the men could only work during a small portion of the nominal hours of labor. Even the tough, wiry mules of the car-train could hardly be driven up to the end of the tunnel, and sought for fresh air not less ardently than the men. Curses, blows, and kicks could scarcely force them away from the blower-tube openings, and more than once a rationally-obstinate mule thrust his head into the end of the canvas air-pipe and was literally torn away by main strength; as the miners, when other means failed, tied his tail to the bodies of two other mules in his train and forced them to haul back their companion, snorting viciously and slipping with stiff legs over the wet floor.[1]

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[1] George J. Specht, C. E., Sutro Tunnel Company.

[2] John Bluett, underground foreman of the Sutro Tunnel Company; Sutro Independent, April 13, 1876.

[3] George J. Specht, C. E., Sutro Tunnel Company.

Neither men nor animals could long endure work so distressing. Fortunately the drills knew no weariness nor pain and churned their way without ceasing to the mines. At length the tunnel drew so near the lode that the men in the Savage Mine could hear the explosion of the blasts and, soon after, the tapping of the drills on the rock partition. These sounds grew more and more distinct until, on the 8th of July, 1878, a few feet of rock alone separated the two working parties. A blast from the Savage Mine tore an opening through the wall in the evening of that day,[2] and the goal for which Sutro had striven for so many years was in sight. He was waiting at the breach impatient of delay, and crawled, half-naked, through the jagged opening while the hot foul air of the heading was still gushing into the mine. If he seemed "overcome by excitement," as reported,[3] it was in no way surprising, for he had triumphed over a host of obstacles and his indomitable spirit had fairly won success. Yet this success might prove a barren victory. The adjoining mines needed the relief thus furnished beyond question, but their owners were not ready to admit the validity of the original contracts made in 1866 with the Tunnel Company. The Savage Mining Company, it is true, professed their readiness to abide by their agreement,[4] but the Tunnel Company naturally objected against draining the Savage Mine while the other mines on the lode refused to pay for the service; for it was an easy matter to divert their water into the Savage Mine levels and thus constrain the Tunnel Company to afford them drainage without consideration. Nor was this imposition a fanciful danger.

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[1] Jos. E. Banks, time-keeper, Sutro Tunnel Company, 1878.

[2] Virginia City Territorial Enterprise, July 9, 1878.

[3] *Ibid.*, July 10, 1878.

[4] *Ibid.*, February 3, 1879.

In February, 1879, the pump-rod of the Hale & Norcross Mine was broken, occasioning a rise of water and an overflow into the combination shaft of the Hale & Norcross, Savage, and Chollar-Potosi mines. In order to hold this overflow in check it was found necessary to pump the water into the Sutro Tunnel, and this was done notwithstanding the lively protest of Mr. Sutro. The heat and volume of the incoming flood drove out the workmen at the face of the heading, and their superintendent looked upon the act as a declaration of war.[1] He had not neglected to prepare for the contest, but his counterwork had been, unfortunately, enjoined. In the previous month he had begun the excavation of a drainway near the face of the tunnel heading, which would conduct all incoming water back into a lower level of the Savage Mine.[2] By this clever device a circulating current would be established, and the same water would be pumped and re-pumped *ad infinitum;* but in some way this design became known to the Savage Mining Company, and the workmen were arrested on the 1st of February, by virtue of an order from Judge Rising, when only 20 feet of their drift was still uncut. The men were at once discharged by the judge upon satisfactory recognizances, but the further excavation of the drainway was prohibited.[3] This was naturally galling to Mr. Sutro, and when the mine companies began to pump water into his tunnel, two weeks later, his indignation was outspoken. He threatened to effectually close the tunnel by a water-tight bulkhead, and it is probable that this act of reprisal would have been lawful, though the Territorial Enterprise scoffed at the idea. It is not unlikely that an underground war was averted by a judicious compromise. The mining companies ceased pumping water into the tunnel as soon as the broken pump-rod of the Hale & Norcross shaft was repaired, and during the following month a satisfactory contract with the Sutro Tunnel Company was drawn and signed by all the companies owning mines on the lode.

If the mines had been as free from water in 1878 as the hopeful mine superintendents expected ten years before, the validity of the old contracts would assuredly have been tested by reference to the court of final appeal. The Sutro Tunnel Company had failed to comply with important specifications therein set forth,[1] and the adit had reached the lode too late to obviate the use of pumping machinery in draining the mine works above its level. These facts were presented in the complaint of divers companies praying for a cancellation of the contracts made in 1866, and answer was filed by the attorneys for the Sutro Tunnel Company in the Fifteenth Judicial District Court of the State of California. In default of any judicial decision the question at issue is still undetermined, for before judgment was rendered the compromise was made and the complaints were withdrawn. The utility of the tunnel as a drainway could no longer be disputed, and the mine companies were ready to pay a fair compensation for this service, irrespective of any existing obligation to this effect. Sums were advanced by the several companies sufficient to secure the extension of the lateral branches of the main tunnel along the line of the lode, and the companies benefited agreed to pay a tax of $1 per ton upon all ore raised from their mines which assayed $40 per ton or less, and $2 per ton for all ore assaying more than $40 per ton, as soon as either of the lateral branches should reach a point midway between their respective end lines.[2]

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[1] Virginia City Territorial Enterprise, February 18, 1879.

[2] *Ibid.*, January 31, 1879.

[3] *Ibid.*, February 2 and 4, 1879.

Since the completion of this compromise the former contestants have worked together in perfect harmony to secure the rapid progress of the work. On the 1st of May, 1879, a force of 1,000 men began to cut a drainage channel five feet in width and three and a half feet in depth in the floor of the tunnel, and two lines of wooden drain-boxes were laid in the channel as soon as completed. Though the men worked with extraordinary energy, it was impossible to finish the drain within the time specified in the original contract, though in 50 days the channel had been extended 16,550 feet from the mouth of the tunnel, and four independent sections had been cut whose aggregate length was 1,326 feet. Accordingly a line of drain-boxes was hastily laid on the track-floor of the tunnel as a continuation of the channel-drain, and on the 30th of June, 1879, several mines began to pump water into the tunnel. The temperature of the water issuing from the end of the drain-box was 101° Fahr., which gradually increased to 118° Fahr., the initial temperature at the close of the year 1880 being about 137° Fahr.[1] The main tunnel was extended to a point 20,489 feet from its mouth, and as the lateral branches were advanced connection was made with the mine shafts as rapidly as possible, so that before the close of the year 1880 a great volume of water was flowing through the tunnel. On the 4th of October, 1880, the length of the north lateral branch was 4,403 feet, when work was discontinued, as mine galleries already excavated furnished the additional length of drainway desired.[2] The length of the south lateral branch, on the 1st of March, 1881, was 4,114 feet, and the heading was advancing rapidly to connect with a drainway or drift from the Yellow Jacket Mine.[3] Both branches are 8 feet in width by 7 in height in the clear. Through these incomplete drainways 208 miner's inches, or 3,500,000 gallons of water, flowed daily during 1880, and the amount received during 24 hours sometimes rose to 232 inches, 3,942,720 gallons.[4] Thus during the year 1,277,500,000 gallons of water, or 4,752,605 tons, were drained from the Comstock Lode, and when the mine connections are fully completed it is estimated that at least half as much more will be discharged through the tunnel. At present, 1881, the only use made of this water is for purposes of irrigation in the valley, and to carry a turbine which propels the machinery in the shops of the company.[5]

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[1] Report of Senate Judiciary Committee, 43d Congress, 1st Session, No. 422.

[2] Pelham W. Ames, Secretary Sutro Tunnel Company.

The cost of excavating and timbering the main tunnel, 20,489 feet in length, up to the date of its completion, Sept. 1, 1878, was $1,367,577.21. By the enlargement of the heading, etc., an additional expense of $296,723.84 was entailed, to which should be added cost of sub-drain, $384,824.10, and cost of repairs, $43,441.34, making total cost of main tunnel (not including expenses of management of company) up to October 12, 1881, $2,096,566.41.[6]

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[1] George J. Specht, C. E., Sutro Tunnel Company.

[2] Annual Report of the Sutro Tunnel Company, 1881, p. 9.

[3] *Ibid.*, p. 10. Connection made March 25, 1881; Territorial Enterprise, March 26, 1881.

[4] Annual Report of the Sutro Tunnel Company, 1881, p. 12; Report of Superintendent C. C. Thomas.

[5] George J. Specht, C. E., Sutro Tunnel Company.

[6] Pelham W. Ames, Secretary Sutro Tunnel Company.

The mining companies had indeed reason to urge forward the completion of the drainway. Since 1874 they had been struggling to make head against the increasing influx of water with only partial success. Up to that time the pumps in place had been able to cope with the increasing floods, though work in a number of mines had been seriously delayed and impeded; but when the shafts began to pass the 2,000-foot level the water influx was no longer held in check. Thus, in 1875, water which entered the Savage and Hale & Norcross mines on the 2,200-foot level rose to the 1,750-foot level in spite of the continuous working of the pumps, and flooded the mines to the depth of 450 feet, as the 2,400-foot level had been partially opened. New pumps, capable of lifting to the surface 10,000,000 gallons per month, were immediately built, but in December, 1878, the water had only been lowered to a point 50 feet below the 2,000-foot level. It is true that the pumps were not working unremittingly, owing to the frequent breaking of the Savage Mine pump-rod, yet it was calculated that during the thirty months ending December, 1878, 450,000,000 gallons, or 1,800,000 tons of water had been taken from the two mines.[1] In some instances, as in the case just cited, the failure to master the water was unquestionably due to the increased flow, for after passing the Carson Valley level the area of drainage had unquestionably extended; in other cases it might be attributed to the inadequacy of the pumping machinery, for engines which could free the mines from water to the level of the Sutro Tunnel were manifestly unable to raise the same number of gallons from a greater depth. When the necessity for more powerful machinery became evident, some of the mining companies whose faith and capital were small contented themselves for some years with prospecting in the upper levels, after months of costly experiment with their ineffective pumps, and allowed the water to rise unopposed to its natural level. Others, more energetic and capable, contracted at once for pumping and hoisting engines of greater power and prepared to push the work of exploration in spite of all obstacles.

In the character of the plant thus erected it was evident that the formidableness of the water plague was clearly realized. The experience of fifteen years had convinced all the mining companies that the influx of water could only be held in check by pumping machinery of the most powerful description. It was a long stride from the first little steam-pump, with a cylinder of eight inches diameter, erected at the Ophir Mine in 1861, to the heavy Cornish pumping-engine in place at the same mine, fifteen years later, which was able to lift, in 1880, 360 gallons of water per minute 900 feet to the Sutro Tunnel level.[1] Yet this engine

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[1] The Comstock Lode: Its Formation and History John A. Church, E. M., p. 23.

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[1] The nearest point of the lateral branch level is 1,597 feet below the top of the Ophir shaft, so that the mine water was actually raised from a depth of 2,500 feet in round numbers. For the sake of clearness a list of the mine shafts and their respective altitudes in reference to the Sutro Tunnel is given.

TABLE A.—*List of shafts and the respective altitudes of their mouths in reference to Sutro Tunnel.*

NAME OF SHAFT.	ALTITUDE ABOVE SEA LEVEL.	ALTITUDE ABOVE THE MOUTH OF SUTRO TUNNEL.	ALTITUDE ABOVE POINT NEAREST SUTRO TUNNEL SHAFT.	
	Feet.	Feet.	Feet.	In.
Utah	5,996	1,513	1,453	4
Sierra Nevada	6,031	1,548	1,492	6
Union	6,068	1,585	1,531	7
Ophir	6,131	1,648	1,597	1
Consolidated Virginia	6,156	1,673	1,623	6
C. & C	6,038	1,555	1,505	6
Bonner	6,194	1,711	1,663	8
Osbiston	5,966	1,483	1,436	1
Savage	6,181	1,698	1,663	8
Hale & Norcross	6,157	1,674	1,627	8
Combination	6,133	1,650	1,618	8
Chollar-Potosi	6,226	1,743	1,695	2
Bullion	6,307	1,824	1,775	3
Ward	6,118	1,635	1,584	9
Imperial	6,160	1,677	1,626	3
Yellow Jacket, "Old"	5,961	1,478	1,424	1
Yellow Jacket, "New"	6,051	1,568	1,514	1
Crown Point	5,925	1,442	1,388	1
Belcher	5,981	1,498	1,444	1
Old Belcher	5,981	1,498	1,444	1
Foreman	6,038	1,555	1,495	4
Old Overman	5,731	1,248	1,192	5
Julia	6,116	1,633	1,585	2
Mint	5,892	1,409	1,363	1

scarcely surpassed the pump of 1861 in power more than it is excelled itself by the engines in place at the great combination shafts, sunk by the mining companies at points hundreds of yards east of their early workings.

The compound direct-acting pumping engine of 480 horse-power, at the joint shaft of the California and Consolidated Virginia Mining companies (C. & C. shaft), lifted during the year 1880 from 480 to 640 gallons per minute to the Sutro Tunnel level, a computed average of 950 feet vertically, raising during the year 1,180,568 tons of water from the bottom of the shaft. At the shaft owned and operated by the Sierra Nevada, Union, and Mexican companies an engine of similar design but of 540 horse-power (high-pressure cylinder, 64-inch diameter and 81-inch stroke; low-pressure condensing-cylinder, 100-inch diameter and 99-inch stroke), working at half capacity, raised 693 gallons per minute, during the year 1880, a distance of 1,100 feet (*i. e.*, from sump to Sutro Tunnel level), or 1,400,706 tons in all, and the compound pumping-engine of the Yellow Jacket Mining Company, working at 400 horse-power during 1880, with five strokes per minute, raised 800 gallons 1,500 feet, vertically, to the Sutro Tunnel level.

To prospect the ledge sections owned by the Overman, Caledonia, and Segregated Belcher companies, at a vertical depth of 4,000 feet, a great shaft was begun on the 18th of September, 1878, and a 600 horse-power pumping-engine erected. It is a direct-acting compound engine, like most of those placed on the lode since 1875, and is designed to cope with any influx which may be encountered. Up to the year 1881 it easily drained the shaft, but it is probable that its capacity will be fully tested before the lode is reached; for into the shaft owned by the Chollar, Hale & Norcross, and Savage Mining companies 102,000 gallons of water was flowing every hour during the spring of 1881, and their 600 horse-power compound condensing pumping-engine could not drain the shaft, though raising 1,000 gallons per minute. Hence a new hydraulic pumping-engine, guaranteed to lift 96,000 gallons per hour from the level reached by the shaft, was erected in April, 1881, and the power of the combined engines is needed in order to prosecute work. But the duty imposed upon the

Comstock pumps is, perhaps, most clearly set forth in the simple record that 20,000 tons of water were raised daily during 1880 to the level of the Sutro Tunnel.[1] It is not surprising that under this extraordinary and prolonged strain the pump-rods have been breaking frequently, though the sections are solid timbers of the best Oregon pine, whose end area is 14 by 16 inches usually, strapped together with 10-inch iron plates.[2]

Whether the excavation of a tunnel for a distance of nearly four miles to drain away this flood was an economic plan cannot yet be determined. To answer this question conclusively the number of years during which the tunnel will be of practical utility must first be known. Its construction has cost in round numbers $2,000,000, exclusive of the large expenses of general management and litigation, which should, perhaps, be added to the amount. To erect pumping machinery of 1,540 working horse-power, capable of raising 20,000 tons of water daily, from the Sutro Tunnel level to the surface-drain tunnel of the Gould & Curry Mine, a lift of 1,300 feet, would cost approximately $225,000, according to recent estimates.[3] For the fuel supply of these engines (or engine) 77 cords of wood would be required every twenty-four hours, or 28,105 cords yearly, the cost of which, at $10 per cord, would be $280,050. If the expense of maintaining and operating this pumping-plant be fixed at $350,000 yearly, or seven times as much as that of repairing the tunnel, it is evident that the difference in cost of maintenance would allow a high rate of interest upon the actual cost of construction of the tunnel, even if the returns to the stockholders of the tunnel company in the form of dividends upon the preposterous stock capitalization were unsatisfactory. If the tunnel can be utilized also, in connection with milling or concentrating works at its mouth, for the reduction of low-grade ores, the cost of its construction may possibly be offset in a few years by the saving thus effected.

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[1] Estimate of W. H. Patton, C. E., Superintendent Consolidated Virginia Mining Company.

[2] The Belcher Mine pump-rod broke twelve times in the eight months ending August 31, 1880, and was discarded in September, 1880, for a new and heavier rod. (Report of W. H. Smith, Superintendent of the Belcher Mining Company, January 22, 1881.) The rods in use three years ago, 11 and 14 inches square (The Comstock Lode, John A. Church, E. M., p. 27), have almost uniformly proved too weak for the service imposed.

[3] W. R. Eckart, C. E., for the United States Geological Survey.

At present (1881) these points are evidently matters of speculation and not of history.

The other plant at the mines corresponds in size and efficiency with the pumping-engines. Ten boilers at the Yellow Jacket Mine works, 16 feet in length and 54 inches in diameter, resting upon a grate surface of 250 square feet, supply steam to engines whose aggregate horse-power is 2,941. The two hoisting-engines at the working compartments of the shaft are 1,000 horse-power each (diameter of cylinder 128 inches and stroke 8 feet), and the pump compartment hoisting-engine is of 500 horse-power (diameter of cylinder 118 inches and stroke 2 feet). At the Union shaft (belonging to Sierra Nevada, Union Consolidated, and Mexican Mining companies) the hoisting-engine for the working compartment is of 1,200 horse-power, and the pump compartment hoisting-engine of 400 horse-power. The twelve boilers, with a grate surface of 270 square feet, consume thirty-three cords of wood every twenty-four hours. The main hoisting-engine at the C. & C. shaft, double cylinder, horizontal, direct-acting, with brake fly-wheels, is of 2,000 horse-power. This great engine raises an iron cage with three car-loads of ore or waste rock, weighing 12,400 pounds,[1] a distance of 2,500 feet with perfect ease, lowering a cage filled with men or empty at the same time. The cables in use are of steel wire, woven into a flat band, 7 inches in breadth and five-eighths of an inch in thickness, passing over sheaves or pulleys 45 feet above the shaft-mouth, and wound over tapering drums from 5 to 14 feet in circumference. But it is unnecessary for the purposes of this report to multiply examples. It is sufficient to note that the aggregate horse-power of the engines on the lode in the spring of 1881 was 20,914, fourteen times as great as in the spring of 1866, fifteen years previously. Indeed, the combined horse-power of the Yellow Jacket Mine engines alone (2,941) is nearly double the total horse-power of the forty-four engines owned by the mining companies then working on the lode.

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[1]

	Pounds.
Weight of cage, three-decker	4,000
Weight of three cars (1,200 lbs.)	3,600
Weight of three car-loads (1,600 lbs.)	4,800
Total	12,400

TABLE *showing Consumption of power and material used on Comstock Lode.*

NAME OF MINE.	Total horse-power of engines.	Pressure of steam.	Quality of fuel used.	Quantity of fuel used per day.	Average quantity of fuel used per year.	Census year ending May 31, '80; number working days.
		Lbs.		*Cords.*	*Cords.*	
Andes	60	65	Yellow pine	1	364	364
Alta	730	100	Pitch pine	12	4,380	365
Baltimore Consolidated		100				
Belcher	140	100	Pine	20	7,300	365
Belcher & Crown Point Pump Shaft.	450	110		19	6,270	330
Best & Belcher	20					200
Bullion Combination	258	100		12	4,380	365
Caledonia	366	90	Pine, tamarack, and fir.	6.38	2,321	364
California, C. & C. Shaft	2,680	100		30	10,950	365
Chollar, Norcross, Savage Con. Shaft.	1,625	90	Pine and fir	15	5,475	365
Chollar-Potosi						90
Consolidated Imperial	816	80	Pine	15	5,475	365
Consolidated Virginia						
Crown Point	630	90	Pine	6.25	2,281.25	365
Forman Shaft	846	80		5.9	2,181	365
Gould & Curry	550	95				
Hale & Norcross	634	100	Pine	19	6,935	365
Justice		100				
Mexican						365
Mint	25	70	Pine	1	365	365
New York		90	Yellow pine	2	730	365
Ophir	1,082	100	Pitch pine	23	8,395	365
Original Keystone		85	Pine, tamarack, and fir.	4	1,460	365
Osbiston Shaft	790	90	" " "	5.50	1,845	335
Overman	524	90	" " "	13.64	4,930	364
Savage	1,541	105				365
Scorpion	40	85	Pine, tamarack, and fir.	1	364	364
Sierra Nevada	965	100	Yellow pine	42	15,330	365
Silver Hill	480	110	" "	24	8,760	365
Union Consolidated Union Shaft	2,370	95	" "	33	12,045	365
Utah	351	100	Pine	6	2,190	365
Yellow Jacket	2,941	100	Yellow pine	30	10,950	365

In the construction and equipment of the reduction works a like preparation has been made for work upon a grand scale. The Consolidated Virginia mill with sixty stamps, forty pans, four agitators, and twenty settlers, can reduce 250 tons of ore in twenty-four hours, while in the California works engines of 600 aggregate horse-power operate eighty stamps weighing 984 pounds each, forty-six pans, four agitators, and twenty settlers, which can crush and amalgamate 380 tons of ore daily. The cost of this admirable plant is very great, as might be supposed. The appraised value of the mine works of the Consolidated Virginia Mining Company (including works at C. & C. shaft) in 1879 was $675,000, and the cost of the California Reduction Works exceeded half a million dollars.

Yet the outlay upon the surface works is only a small proportion of the actual amount expended by the mining companies. In sinking the joint shaft of the California and Consolidated Virginia mining companies to the depth of 2,200 feet, nine hundred thousand dollars ($899,962.80) were paid for labor, supplies, and incidental expenses.[1] When a mine becomes productive its operating expenses are reckoned by millions rather than thousands of dollars. Thus, during a single year, 1877, the California Mining Company expended more than $4,000,000, viz:

Actual Cost of Mine.	Dr.
Supplies consumed	$357,101.67
Salaries and wages	788,012.00
Office expense	3,047.70
Taxes	461,637.93
Surveying	1,050.00
Legal expense	70,426.20
Team account	780.25
Hoisting	186,461.82
Reduction	2,220,007.87
Assaying	53,208.19
Interest and exchange	9.156.01
Half expense C. & C. shaft	131,000.00
Total	$4,281,889.64
	Cr.
Sale of supplies	$143.32
Interest	194.12
General expense, cash returned	120.65
Balance, actual cost of mine	4,281,431.55
Total	$4,281,889.64

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[1] Report of W. H. Patton, Superintendent; Annual Report Consolidated Virginia Mining Company, 1879, pp. 33, 43, 44.

An itemized statement of supplies purchased by the same company during this year (1877) conveys a more accurate idea of the character and extent of the under-ground work than is given by the simple record of the length of drifts cut and of the number of tons of ore extracted; for a very large amount of extra work was done in keeping the main shaft and stations in serviceable condition, in maintaining the working drifts, and in opening air connections.[1]

Supplies Purchased, 1877.

Timber, 10,430,645 feet	$224, 977. 52
Wood, mahogany, 12 cords	216. 00
Candles	15, 950. 50
Powder	17, 340. 95
Fuse	2, 662. 37
Oil	4, 683. 70
Picks, sledges, and handles	1, 263. 87
Axes and handles	333. 00
Shovels	952. 00
Iron: Plate, 53,000 pounds	3, 180. 00
Round and square, 3,551 pounds	212. 47
T-rail and fittings, 28,510 pounds	1, 096. 43
Angle, 1,800 pounds	80. 03
Steel, 6,400 pounds	1, 103. 50
Nails and spikes, 9,300 pounds	489. 85
Lanterns and sconces, 31 dozen	460. 00
Brooms, 65 dozen	509. 25
Buckets and dippers, 41 dozen	424. 00
Gas-pipe, 3,403 feet	794. 43
Air-pipe, 403 feet	442. 75
Ice, 1,957,402 pounds	21, 899. 43
Tallow, 400 pounds	36. 00
Hose, 425 feet	328. 73
Belting, 175 feet	37. 55
Caps, 1,090 boxes	1, 123. 00
Ore cars, 28	3, 080. 00
Blowers, 9	405. 00
Sample sacks, 1,000	97. 50
Wheelbarrows, 38	696. 00
1 small engine	355. 00
	$305,130.83

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[1] Annual Report of the California Mining Company, 1878; Report of W. H. Patton, Superintendent, p. 17.

Brought forward	305,130.83
Lagging	105.00
Paint	338.61
Freight	1,844.50
Cartage	151.00
Coal and charcoal	2,280.37
Medical supplies	832.58
Clothing	367.25
Miscellaneous supplies	4,010.53
Total	$315,060.67

Yet the supplies purchased were only a portion of those actually consumed, costing $356,958.35, without reckoning the fuel, timber, and other supplies consumed in the hoisting-works and shaft (the C. & C.), which cost an additional sum of $547,416.80.[1] Fully 600,000,000 feet of timbers have been buried in the mines,[2] an amount sufficient to build a town of nearly thirty thousand two-story frame houses (each 40 by 25 feet and containing six rooms) which would comfortably shelter 150,000 inhabitants. More than two million cords of wood have been consumed as fuel by the mine hoisting-works and by the mills reducing ores from the lode.

Records of Virginia and Truckee Railroad.

YEARS.	LUMBER SHIPMENTS.	WOOD SHIPMENTS—FUEL.
	(In feet.)	*(In cords.)*
1874	52,220,801	139,808
1875	72,596,465	179,295
1876	71,633,072	212,278¼
1877	38,981,967	221,496⅝
1878	34,427,502	205,311⅜
1879	31,443,771	185,022¼

NOTE.—Free freight (Railroad Company's supplies) included in the above statement.

The accompanying diagram-map shows more graphically than a description the extent and position of the claims on the lode:

---

[1] Annual Report of the California Mining Company, 1878, p. 34.

[2] Careful estimate based on official reports of Mining Companies; of State Surveyor General; of United States Mining Commissioner, and Records of Virginia and Truckee Railroad.

By the companies holding these claims and their predecessors 140 miles of mine-galleries have been excavated during the past twenty years,[1] and 7,000,000 tons of ore have been extracted.[2] With scarce an exception the shafts of their mines have penetrated more than 2,000 feet into the mountain side, while the deepest have passed the 3,000-foot level.[3]

On the line of the lode the cities which have been reared contain a population of 16,000, according to the Census of 1880,[4] which has been swelled in times of bonanza to more than 20,000. The following table, showing the relative numbers and character of the business establishments in Virginia City and Gold Hill, may be compared with the like table prepared at the close of the year 1860 (p. 94):

Business houses, shops, &c., in Virginia City and Gold Hill, 1880.

Groceries	39
Dry goods	6
Clothing	7
Merchant tailors	7
Boots and shoes	5
Milliners	7
Furniture stores	6
Butcher-shops	15
Fruit	5
Liquor merchants	5
Tobacconists	9
Fancy goods	3
Stationers	4
Hardware	3
Tin-ware and stoves	3
Harness makers and saddlers	3
Druggists	8
Music store	1
Paints and oils	1
Giant powder agency	1
Wire-rope	1
Sewing-machine agency	1
Gun-shop	1
Pawnbroker	1
Lodging-houses	12
Restaurants	22
Board-and-lodging houses	10
Hotels	2
Livery stables	5
Bankers	3
Brokers	11
Undertakers	3
Feed-stables	2
Saloons	100
Boiler-shops	2
Blacksmith-shops	7
Dairies	11
Prisons (county jail)	1
Foundries	3
Ice dealers	4
Theatre	1

There are 2,200 buildings in Virginia City, 92 of which are of brick. Of the 213 business houses in Virginia City which pay license 91 are brick buildings.

---

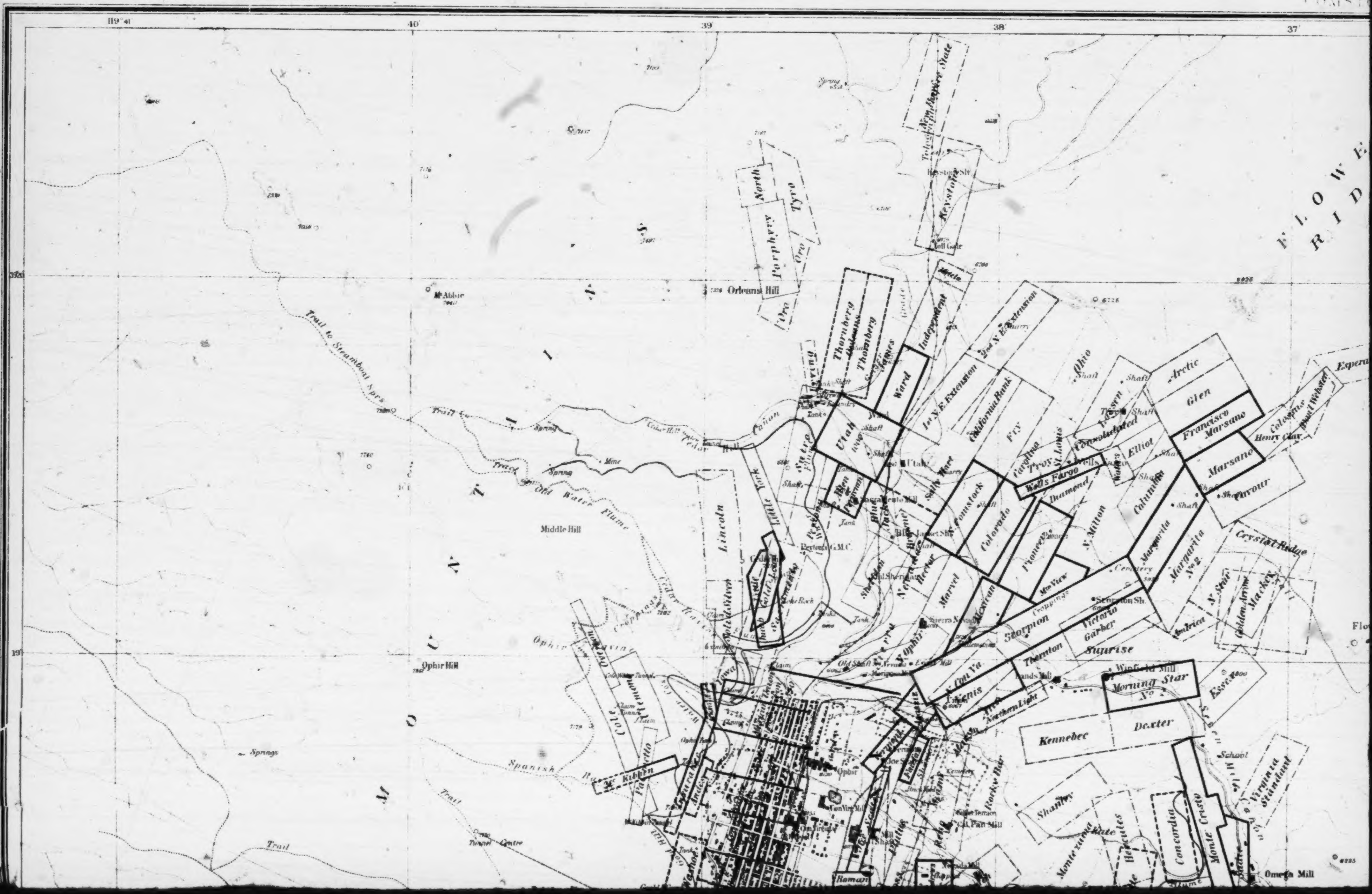
[1] Maps of L. J. Wrinkle, Official Surveyor.

[2] Official Reports of Comstock Mining Companies and County Assessors' Reports.

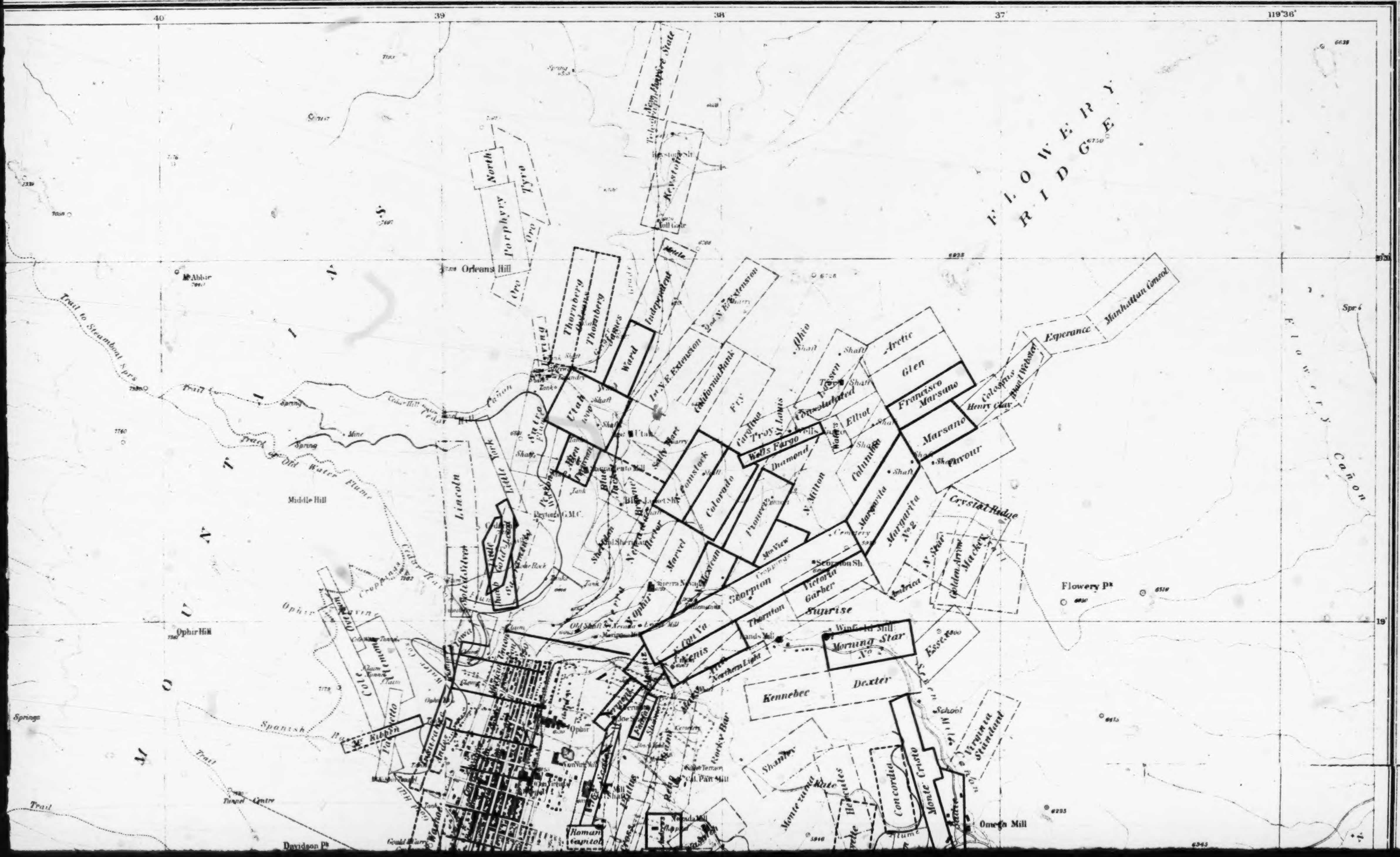
[3] Belcher and Yellow Jacket Mine shafts.

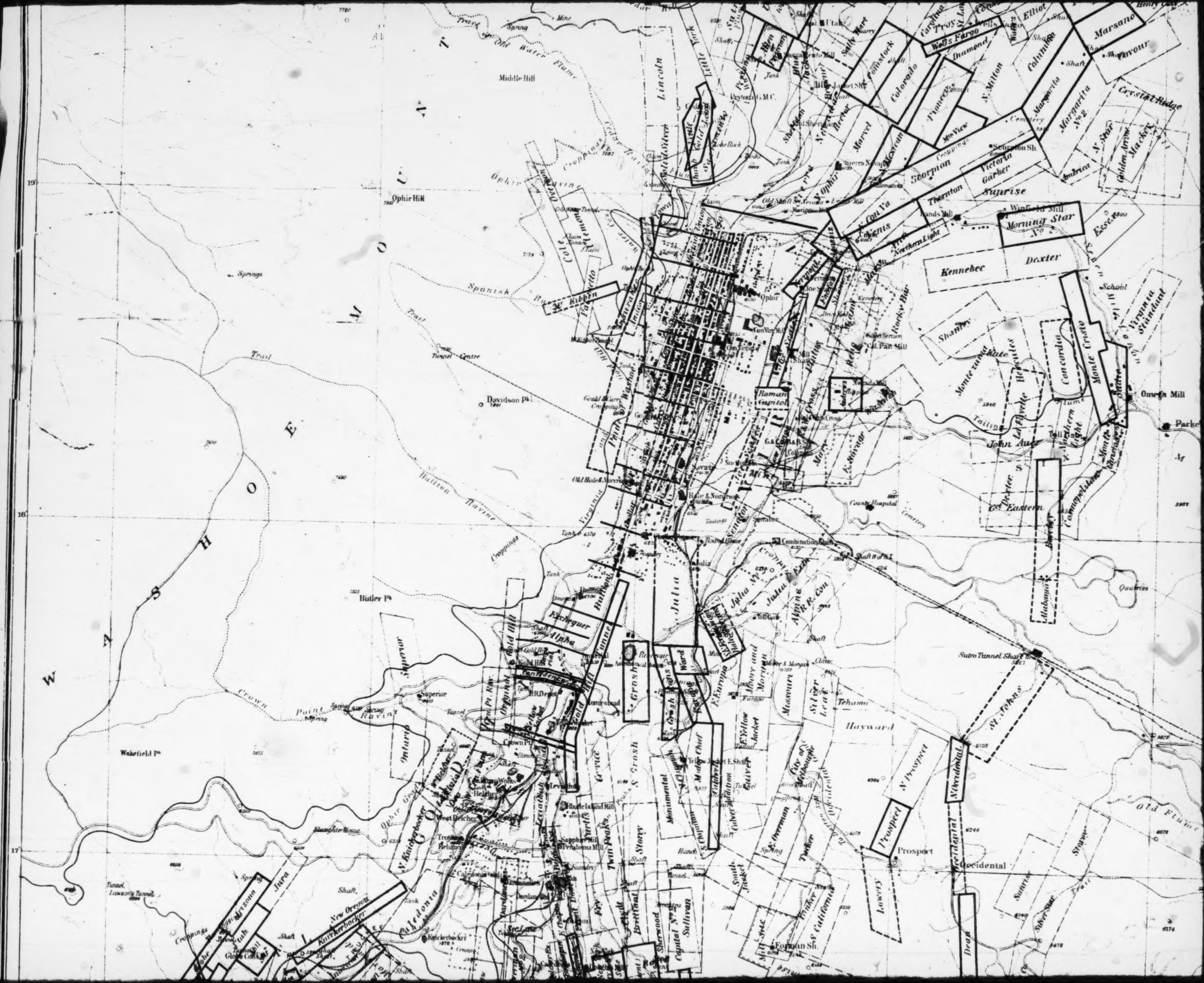
[4] Population of Virginia City, 10,917; Gold Hill, 4,531; Silver City, 605.

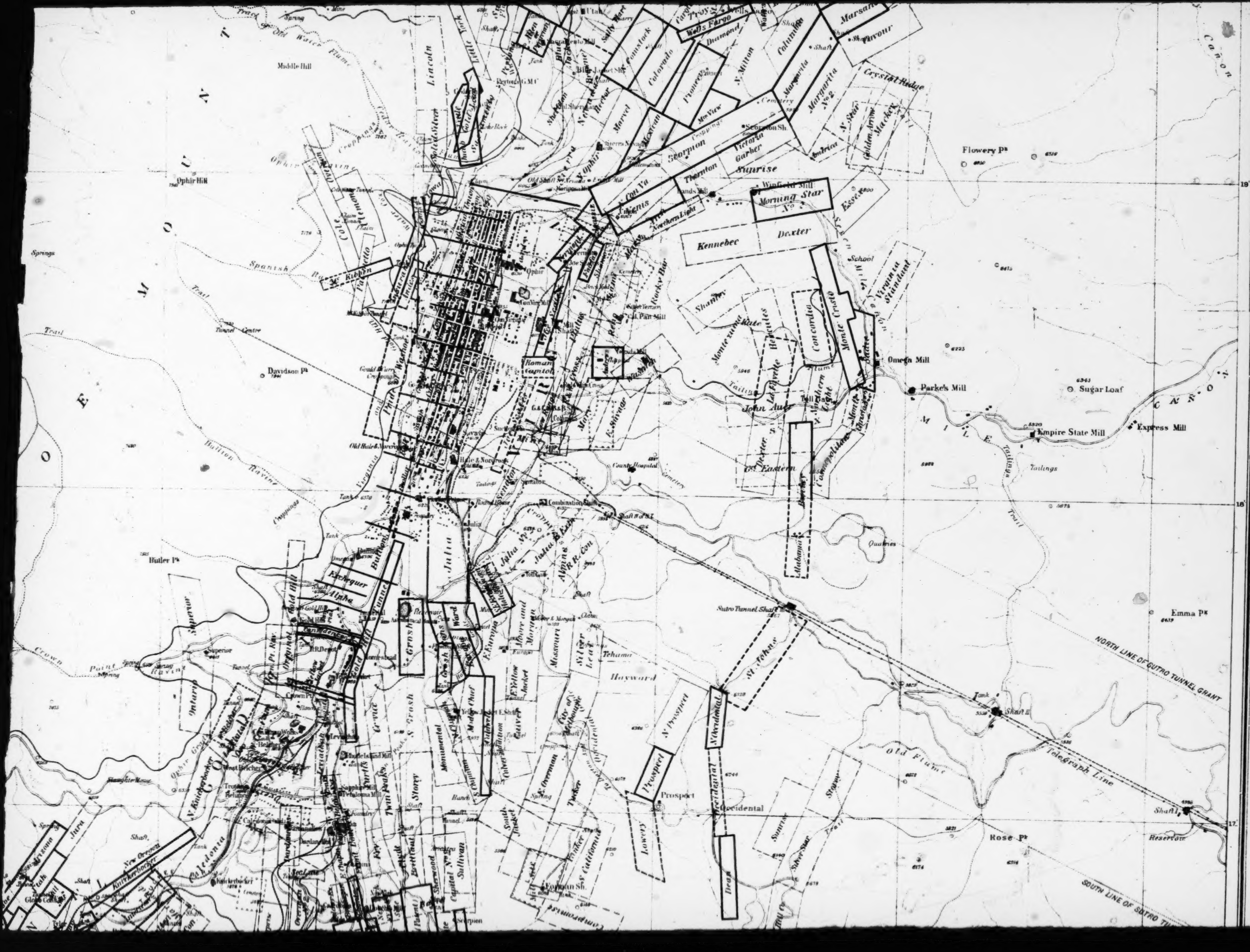
MAP OF THE
WASHOE DISTRICT
SHOWING MINING CLAIMS.

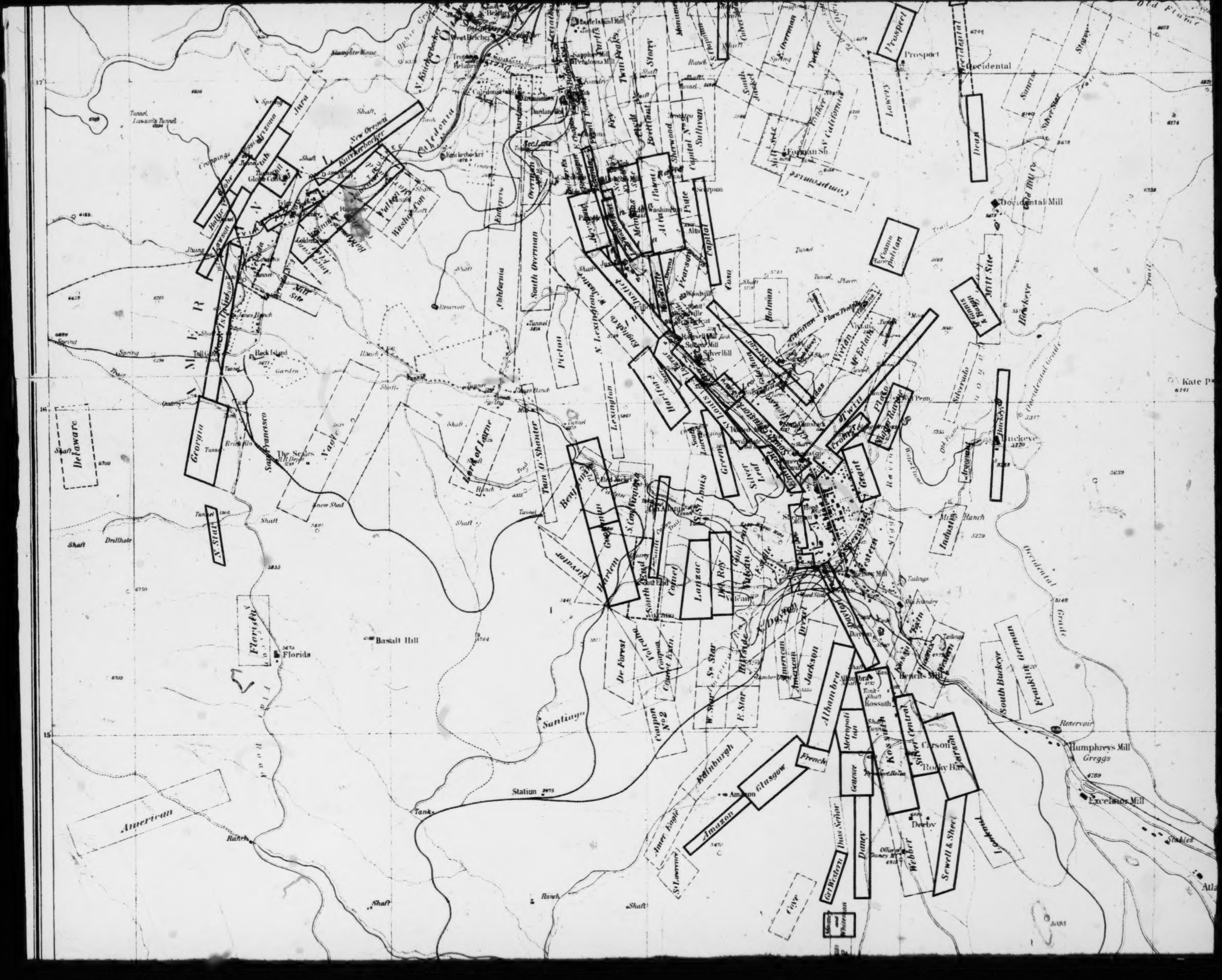

119° 41
40'
39'
38'
37'
FLOWERY RIDGE
MOUNTAINS
Mt Abbie
Orleans Hill
Middle Hill
Ophir Hill
Trail to Steamboat Sprs.
Old Water Flume
Spring
Mine
Springs
Spanish Ravine
Trail
Tunnel Centre
Cedar Hill Cañon
Ophir Ravine
Empire State
Keystone
North
Tyro
Porphyry
Oro
Thornberg
Independent
Ward
Utah
Lincoln
Little York
Sacramento Mill
2nd N.E. Extension
1st N.E. Extension
California Bank
Fry
Ohio
Arctic
Glen
Francisco
Marsano
Henry Clay
Colombus
Daniel Webster
Esperanza
Comstock
Colorado
Troy
St. Louis
Consolidated
Wells Fargo
Diamond
Elliot
Columbia
Cavour
N. Milton
Pioneer
Crystal Ridge
Margarita
Margarita No. 2
Cemetery
N. Star
Golden Arrow
Mackey
America
Mt. View
Marvel
Scorpion
Victoria
Garber
Sunrise
Thornton
Winfield Mill
Morning Star
Essex
Kennebec
Dexter
Northern Light
Cons. Va.
School
Virginia Standard
Shamrock
Montezuma
Concordia
Monte Cristo
Omega Mill
Cole
Mc Kibben
Ophir
Savage
Rocky Bar
Roman

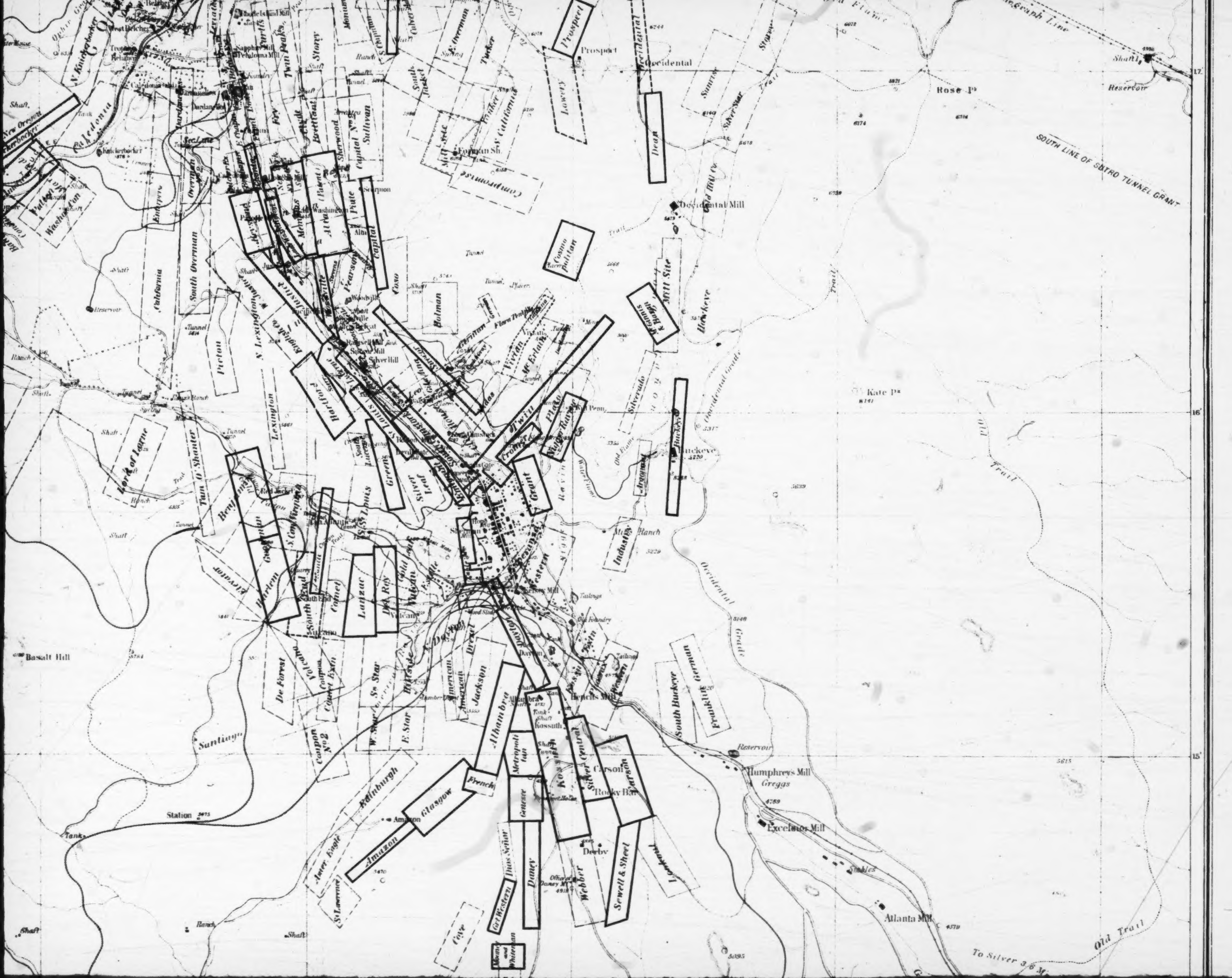
MAP OF THE
WASHOE DISTRICT
SHOWING MINING CLAIMS.

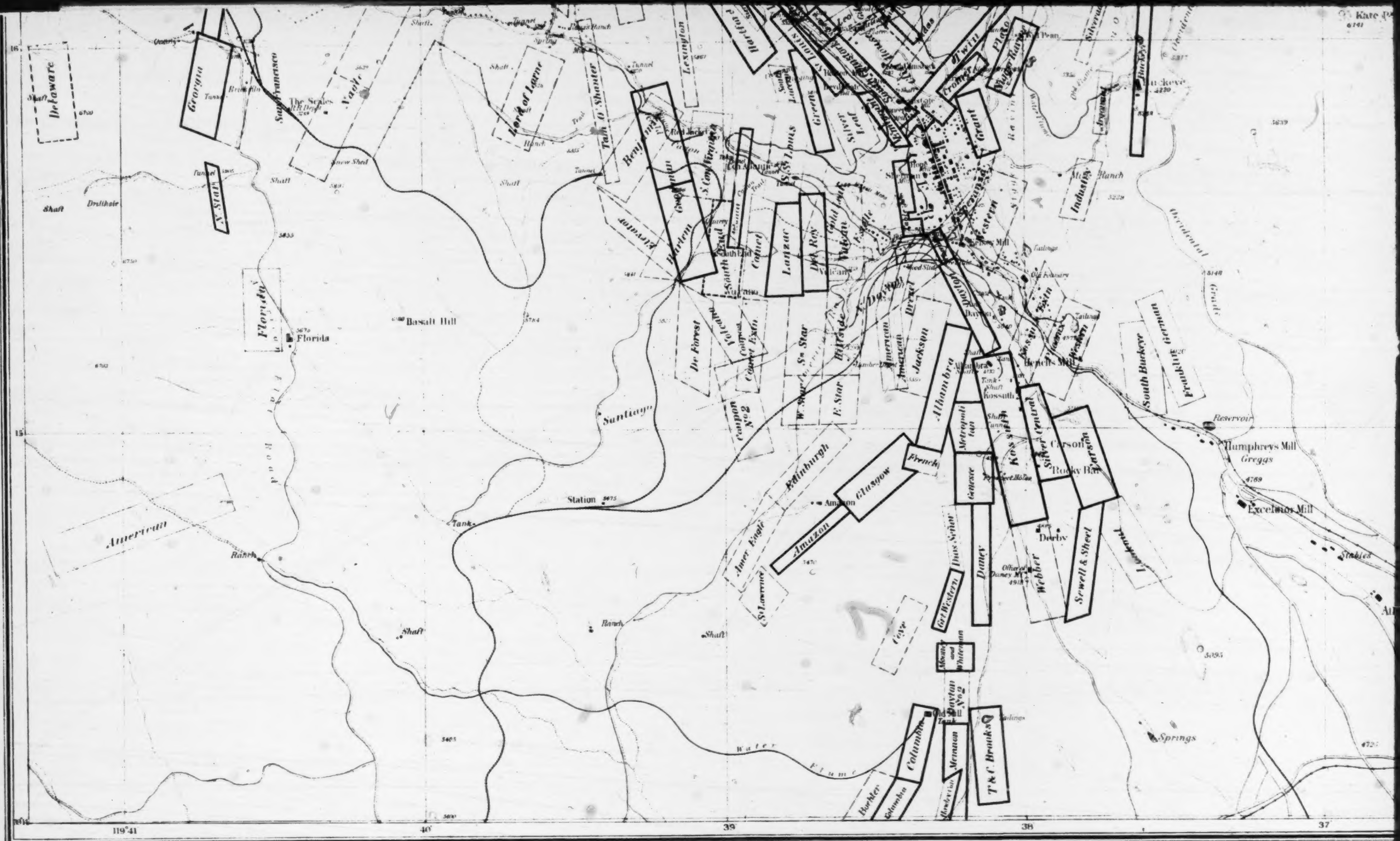

40
39
38
37
119°36'
19'
FLOWERY RIDGE
Flowery Cañon
Flowery Pk
Trail to Steamboat Sprs
Old Water Flume
Middle Hill
Ophir Hill
Orleans Hill
Mt Abbie
Davidson Pk
Spanish Ravine
Cedar Hill
Cedar Hill Cañon
Spring
Springs
Mine
Trail
Empire State
Keystone
North
Porphyry
Tyro
Oro
Thornberg
Uncle Sam
Ward
Independent
Utah
Lincoln
Little York
Sutro
1st N. E. Extension
2nd N. E. Extension
California Bank
Fry
Ohio
Arctic
Glen
Consolidated
Troy
Wells Fargo
St. Louis
Diamond
Elliot
Francisco Marsano
Marsano
Cavour
Henry Clay
Colossus
Daniel Webster
Esperance
Manhattan Consol.
Comstock
Colorado
Columbia
Marguerita
Marguerita No. 2
Crystal Ridge
N. Milton
Pioneer
Mt. View
Marvel
Mexican
Ophir
Scorpion
Scorpion Sh.
Victoria
Garber
Sunrise
Thornton
Con. Va.
Venus
Northern Light
Morning Star
Winfield Mill
Essex
Dexter
Kennebec
Mackay
Golden Arrow
America
N. Star
Shanley
Montezuma
Kate
Hematite
Concordia
Monte Cristo
Virginia Standard
Roman Capitol
Rocky Bar
School
Omega Mill
Cemetery
Flume
Tank
Shaft
Mc Kibben
Cole
Ophir Ravine
Claim
Tunnel
Centre
Croppings
7760
6750
6823
6728
6510
6545
6295
6638


W A S H O E M O U N T
Middle Hill
Ophir Hill
Davidson Pk
Butler Pk
Wakefield Pk
Old Water Flume
Ophir Ravine
Spanish Ravine
Hallton Ravine
Crown Point Ravine
Trail
Tunnel Centre
Croppings
Springs
Lincoln
Little York
Cole
Fairbanks
Mc Kibben
Superior
Inland
Exchequer
Alpha
Confidence
Julia
Grosh
Ward
Roman Canton
Alta
Alpine
Succor
Comstock
Colorado
Wells Fargo
Diamond
Columbia
Marsano
Cavour
Crystal Ridge
Margarita
Margarita No 2
America
N. Star
Golden Arrow
Mackey
Scorpion
Scorpion Sh.
Victoria
Garber
Thornton
Sunrise
Con Va
Venus
Morning Star
Winfield Mill
Kennebec
Dexter
Essex
Shanley
Monteranda
Hercules
Concordia
Monte Cristo
Virginia Standard
La Fayette
Omega Mill
John Aug
Gt. Eastern
Alabama
Ophir
Con Va Mill
Hale & Norcross
Savage
County Hospital
Cemetery
Combination Shaft
Senator
Sutro Tunnel Shaft
St. Johns
Missouri
Tehama
Hayward
Prospect
N. Prospect
Occidental
Lowery
Dean
Sunrise
Silver Star
Old Flume
Quarries
Monumental
Knickerbocker
N. Knickerbocker
New Orleans
Caledonia
Arizona
Jura
Lawson's Tunnel
Slaughter House
Crown Pt.
Belcher
West Belcher
Sullivan
Capital No 2
Storey
Twin Peaks
S. Overman
Tucker
S. California
South Jacket
Yellow Jacket
E. Yellow Jacket
Silver Hill
City of Melbourne
Forman Sh.
Touraine
Europa
Moore and Morgan
Silver Lead
Occidental
Prospect
Parker


Middle Hill
Ophir Hill
Davidson Pk
Butler Pk
Flowery Pk
Sugar Loaf
Emma Pk
Rose Pk
Springs
Spanish Ravine
Crown Point Ravine
Trail
Tunnel Centre
Old Water Flume
Lincoln
Comstock
Colorado
Diamond
Columbia
Marsala
Favour
Wells Fargo
Pioneer
N. Milton
Margarita
Margarita No 2
Crystal Ridge
Scorpion
Thornton
Victoria
Garber
Sunrise
Morning Star
Winfield Mill
Mackey
Golden Arrow
N. Star
Andrica
Kennebec
Dexter
Essex
School
Shanley
Concordia
Monte Cristo
Virginia Standard
Hercules
La Fayette
John Auer
N. Western Light
Cosmopolitan
Gt. Eastern
Alabama
Omega Mill
Parke's Mill
Empire State Mill
Express Mill
Tailings
Quarries
Roman Capitol
County Hospital
Cemetery
Combination Shaft
Shaft No 1
Julia
Alpine
R.R. Con
Savage
Hale & Norcross
Senator
Ophir
Mc Kibben
Cole
Exchequer
Alpha
Bullion
Gold Hill
Confidence
Superior
Ontario
Ward
Grosh
S. Grosh
Eclipse
Yellow Jacket
Moore and Morgan
Missouri
Silver Leaf
Tehama
Hayward
City of Melbourne
Sutro Tunnel Shaft
St. Johns
N. Prospect
Prospect
Occidental
Dean
Lowery
Storey
Sunrise
Silver Star
Old Flume
Telegraph Line
Shaft 2
Shaft 1
Reservoir
NORTH LINE OF SUTRO TUNNEL GRANT
SOUTH LINE OF SUTRO TUNNEL
Caledonia
Knickerbocker
New Orleans
Arizona
Utah
Monumental
Twin Peaks
Sullivan
Capital No 2
Sherwood
Forman Sh.
Yellow Jacket
Lady Bryan
Crown Point
Belcher
Segregated Belcher
Overman
Caledonia
Slaughter House
MOUNT DAVIDSON
CAÑON
SIX MILE CAÑON
19'
18'
17'


Old Flume
Prospect
Occidental
Lowery
Dean
Savage
Silver Star
Occidental Mill
Cosmopolitan
Myll Site
Buckeye
Kate P
Buckeye
Occidental Grade
Industry
Mills Ranch
Twin
Plato
Grant
Western
South Buckeye
Franklin German
Reservoir
Humphreys Mill
Greggs
Excelsior Mill
Stables
Atla
Carson
Rocky Bar
Derby
Sewell & Sheet
Webber
Daney
Gt. Western
Cove
Amazon
Glasgow
French
Edinburgh
Amazon
Amer. Eagle
St. Lawrence
Alhambra
Metropolitan
Genesee
Kossuth
Silver Central
Jackson
American
Dayton
Hells Mill
Lazaar
Del Roy
Comet
St. Louis
Silver Leaf
Green
Harlem
Goodman
Benjamin
Elevator
Coupon No. 2
De Forest
Volcano
South End
Santiago
Station
Tank
Ranch
Shaft
Florida
Florida
Basalt Hill
American
N. Star
Drillhole
Tunnel
Shaft
Delaware
Georgia
San Francisco
The Scales
Nagle
Snow Shed
Lord of Lorne
Tam O'Shanter
Pictou
Lexington
South Overman
California
Overman
Caledonia
Knickerbocker
N. Knickerbocker
New Orleans
Baltic
Grecian
Jura
Tunnel
Lawson's Tunnel
Spring
Croppings
Rock Island
Garden
Mill Site
Washington
Pattin
Reservoir
N. Lexington
Justice
Pearson
Capital
Ute
Cosu
Bolman
Sullivan
Capital No.
Sherwood
Brilliant
Storey
Twin Peaks
Sapphire Mill
Petaluma Mill
Belcher
Gold Hill
Silver Hill
Woodville
Sherman
Tailings
Old Foundry
Kate Hayes
Vivian
Flora Temple
Comstock
Forman Sh.
S. California
Tucker
Overman
Spring
Slaughter House


Telegraph Line
Shaft
Reservoir
17'
Rose Pk
SOUTH LINE OF SUTRO TUNNEL GRANT
Prospect
Occidental
Dean
Lowery
Sutro
Silver Star
Occidental Mill
Cosmopolitan
Mott Site
Buckeye
Tunnel
Kate Pk
16'
Occidental Grade
Buckeye
Trail
Old Trail
Industry
Ranch
Ravine
Tailings
Occidental Grade
South Buckeye
Franklin German
Reservoir
Humphreys Mill
Greggs
Excelsior Mill
15'
Stables
Atlanta Mill
To Silver City
Old Trail
Carson
Rocky Bar
Silver Central
Kossuth
Metropolitan
Geneva
French
Glasgow
Edinburgh
Amazon
Amer. Eagle
St. Lawrence
Daney
Webber
Sewell & Sheet
Derby
Cove
Gd Western
Mono and Whiteman
Alhambra
Jackson
Station
Tank
Basalt Hill
Santiago
Capon No. 2
W. Star
E. Star
So. Star
De Forest
Volcano
Lanzac
Dr. Roy
Vulcan
Comet
South End
Harlem
Goodman
Benjamin
Elevator
Tam O'Shanter
Lord of Lorne
Lexington
Picton
South Overman
California
Knickerbocker
Caledonia
Paton
Washington
New Oregon
Overman
Fry
Sherwood
Capital No. 2
Sullivan
Twin Peaks
Storey
Sapphire Mill
Belcher
Trench
Compromise
Forman Sh.
S. California
Tucker
E. Overman
South Jacket
Capital
Coso
Holman
Pearson
Silver Hill
Hartford
Greens
Silver Leaf
Grant
Twin
Plato
Vivian
McErlain
Woodville
Silverado
Western
Dayton
Bench Mill
Basalt
Reservoir
Shaft
Ranch
Tunnel


Delaware
Georgia
San Francisco
The Scales
Vault
Lord of Lorne
Tam O'Shanter
Lexington
Hartford
Twin
Plato
Bullion
Buckeye
Benjamin
Goodman
Harlem
St. Louis
Greens
Silver Leaf
Grant
N. Star
Shaft
Tunnel
Basalt Hill
Florida
Industry
Ranch
South End
Comet
Lanzac
Dex Roy
Vulcan
De Forest
Volcano
Comet Extn
St. Star
E. Star
W. Star
Bullion
Dayton
American
Jackson
Alhambra
Kossuth
Metropolitan
Silver Central
Carson
Rocky Bar
Benchs Mill
South Buckeye
Franklin German
Santiago
Coupon No. 2
Edinburgh
Glasgow
French
Amazon
Amer. Eagle
Station
Tank
Ranch
St. Lawrence
Gaucie
Daney
Gt. Western
Derby
Webber
Sewell & Sheet
Reservoir
Humphreys Mill
Greggs
Excelsior Mill
Stables
Cox
Dayton No. 2
Columbia
Memnon
T. & C. Brooks
Boehler
Tailings
Springs
Water Flume
Occidental
119°41
40
39
38
37
15
16

Claims Mapped by HOFFMAN and CRAVEN 1881

Topography by U.S. Geographical Surveys West of the 100th Meridian

JULIUS BIEN & CO. LITH. N.Y.

EXPLANATION OF LINES.

Patented

Patent applied for

U.S. Surveys

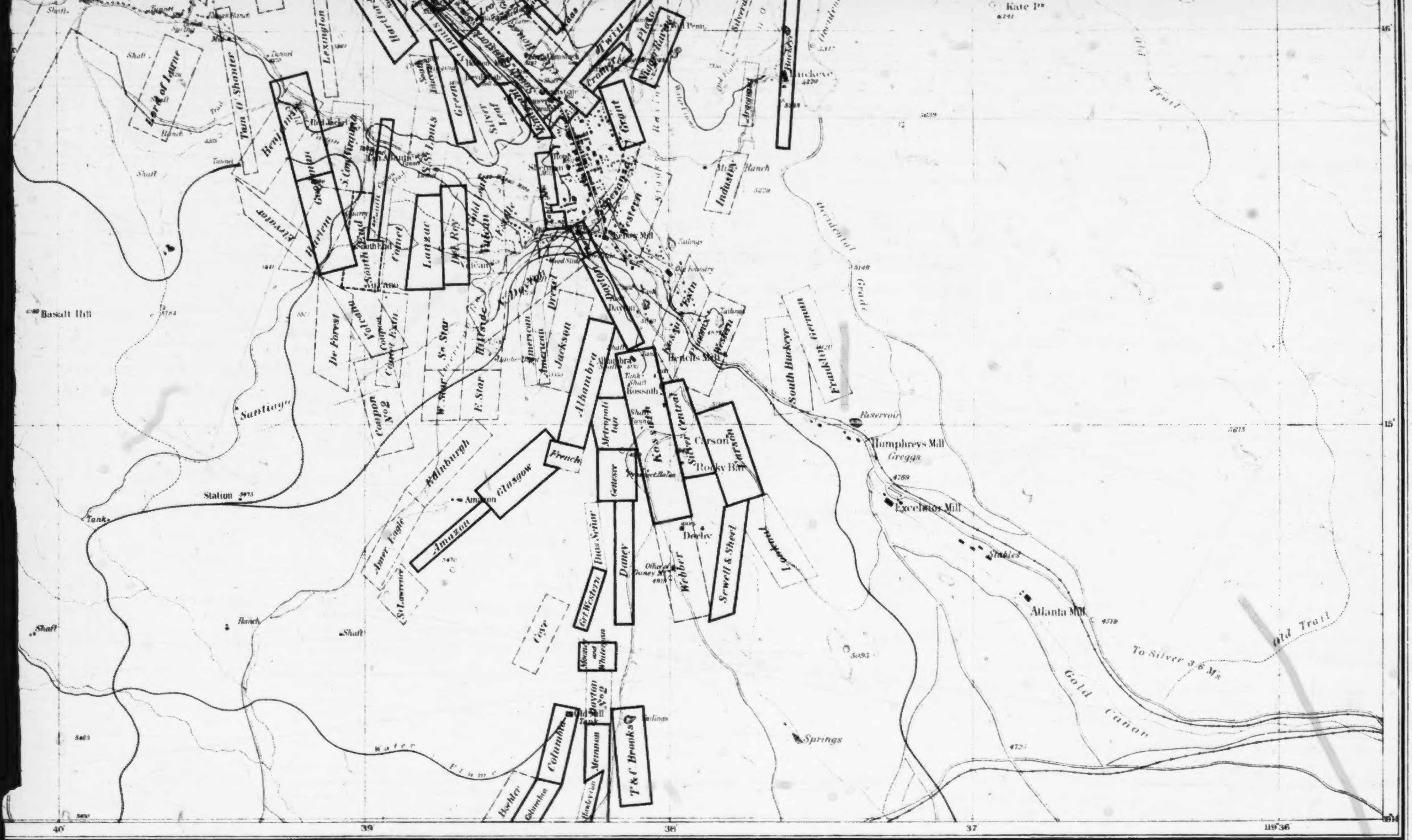
Private Surveys

Scale 1500 feet 1 inch   Contours 50 feet vertical interval

Feet   1 Mile

Meters

This Map was prepared under the direction of G. F. Becker, U.S. Geological Survey, to accompany his report on the Geology of the Comstock Lode


Basalt Hill
Lord of Lorne
Tam O'Shanter
Lexington
Benjamin
Overman
Harlem
S. Comstock
Elevator
Lanzac
Dex Roy
Vulcan
South Overman
Comet
De Forest
Voltaire
Comet Extn
Capon No 2
Santiago
Edinburgh
Glasgow
French
Amazon
Amer. Eagle
St Lawrence
W. Star
E. Star
Sn Star
U. S. Star
Hillside
American
Jackson
Alhambra
Dayton
Metropolitan
Genesee
Kossuth
Silver Central
Carson
Rocky Bar
Daney
Dios Señor
Gt Western
Webber
Sewell & Sheel
Derby
Cove
Mount and Whitman
Dayton No 2
Columbia
Memnon
T&C Brooks
Boehler
South Buckeye
Franklin
German
Industry
Argonaut
Buckeye
Grant
Silver Leaf
Twin
Reservoir
Humphreys Mill
Greggs
Excelsior Mill
Stables
Atlanta Mill
Old Trail
To Silver 3.6 Ms
Gold Cañon
Springs
Water Flume
Occidental Grade
Station
Tank
Shaft
Ranch
Kate Pk
16'
15'
40'
39'
38'
37
119°36

Topography by U. S. Geographical Surveys West of the 100th Meridian

JULIUS BIEN & CO LITH N.Y.

ELIOT LORD in Charge

EXPLANATION OF LINES.

Patented

Patent applied for

U. S. Surveys

Private Surveys

Scale 1500 feet 1 inch Contours 50 feet vertical interval

Feet 1000 0 1000 2000 3000 4000 5000 1 Mile

0 200 400 600 800 1000 Meters

This Map was prepared under the direction of G. F. Becker U. S. Geological Survey to accompany his report on the Geology of the Comstock Lode

It will be seen that the requirements of the Comstock mining towns are nearly as varied and comprehensive as those of any modern city of equal size. The people have been able to pay for what they wanted, and hence have been as well cared for as if their homes were not among barren hills, shut off from the sources of supply by mountains and deserts. It is true that the cost of maintaining these exotic towns with their manifold wants has been enormous. The supplies, exclusive of timber and fuel, imported by the mining towns during the past twenty years, certainly exceed 600,000 tons, and the freight-charges at a low estimate would amount to $50,000,000.[1] Yet this outlay has been justified, for the product of the mines up to the 1st of January, 1881, has been in round numbers 7,000,000 tons, yielding bullion valued at $306,000,000.[2]

The dividends paid by the several companies up to the close of the census year June 30, 1880, aggregate $116,000,000, and to this amount should be added the profits gained by individual owners and unincorporated associations, not reported, but probably amounting to at least $2,000,000—in all $118,000,000. The sum of assessments paid during the same period is $62,000,000,[3] showing a balance of profit of $56,000,000.[4]

---

[1] *Vide* Table XIV, Appendix. [2] *Vide* Table II, Appendix. [3] *Vide* Table III, Appendix.

[4] Mr. Alexander Del Mar, in his recently published History of the Precious Metals, makes an ingenious attempt to prove the unprofitableness of mining operations on the Comstock Lode, and reaches the conclusion that "each pounds' worth of doré has cost to the mine owners about five pounds." This astonishing proposition is based on the assumption that "the Comstock Lode has cost from £120,000,000 to £140,000,000, if the highest price be taken, which each mine at one time or another has brought."[*] Yet Mr. Del Mar must know well that stock exchange sales do not always mean transfers of cash from one person to another, and that preposterous quotations are only possible when few wish to sell and all to buy. If mining stocks were bought as investments usually, and not for the purpose of speculation upon the deposit of "margins," his figures might be less questionable; but the available capital of the stock market is ridiculously disproportioned to its fictitious valuations, and even in times of the wildest excitement a large holder can break the market at will by the actual disposal of the shares in his hands. £140 000,000 was never paid for the Comstock Lode Mines, and even if it had been paid Mr. Del Mar's conclusion is invalid or misleading; for the profits of mining can only be reckoned fairly as the difference between the yield and the cost of acquiring and developing the ledge locations. Now the prospectors or original locators on the line of the Comstock Lode received less than $200,000 for their claims. The working capital contributed by their grantees, or derived from the sale of reserve stock prior to the levy of assessments, did not exceed $1,000,000, certainly. Assessments and the bullion product have defrayed all expenses of production since 1860. Therefore, $1,200,000 + the bullion product and + assessments but − dividends and the market value of the mines and mining plant will represent the actual costs of mining on the lode, and the difference between this sum and the total yield will be the actual profits of mining. This is a considerable sum, and would assuredly have been greater if the operating expenses had not been swelled by early extravagance, ignorance, and litigation.

[*] History of the Precious Metals; Del Mar, p. 266.

Reviewing this exhibit it may fairly be said that silver mining on the Comstock Lode has assumed gigantic proportions—is conducted on a magnificent and unprecedented scale. It can scarcely be doubted that the extraordinary progress here made evident is largely due to the system of mine ownership. The wide distribution of the mine shares, the comparatively light burden of assessments upon individual holders, and the daily revival of interest in the mines, through the agency of the stock exchanges, have united to maintain a rate of development hitherto without parallel in mining history. When at times the general public have hesitated to supply funds and the industry of the district has been depressed, daring speculators have risked their fortunes on the cast and continued the search for ore. Thus the work has never been suffered to flag, and thus borrasca has been displaced by bonanza.

CHAPTER XVIII.

THE LABORERS OF WASHOE.

To the miners of Washoe this persistent search and liberal supply of capital has been a perennial bonanza. For fourteen years they have contrived to uphold their arbitrary standard of wages and have excluded all laborers except members of the unions from obtaining work in the mines; nor have they always been content to rule the mining industry alone, but they have constituted themselves guardians of the laboring classes throughout the district whenever they saw fit to do so.

In May, 1869, the miners' unions of Virginia City and Gold Hill issued a formal appeal to the workingmen of Nevada, calling upon all branches of labor to organize and send delegates to a Workingmen's Convention, at Virginia City, July 6, 1869. The declared object of this organization "was to maintain the wages of labor at a satisfactory standard, and to prevent the firm seating of Chinese labor in our midst." "Present immunity," continued the florid manifesto, "is no criterion for future security. Can the Typographical Union beat back the swelling tide of coolies?" etc., etc.[1] The appeal did not excite much interest beyond the limits of the Washoe district, and the projected combination of workingmen throughout the State was never completed; but within the domain of the miners' unions their word was law. If the Typographical Union could not beat back the coolie tide, the miners' unions were able and willing to stem it. No superintendent had dared to employ Chinese laborers in the mines, but when Mr. Sharon and his associates undertook the construction of the Virginia & Truckee Railroad, a considerable body of Chinese was engaged to grade the road-bed. For some time they were allowed to work unmolested, though the spectacle was gall and wormwood to the rulers of the Comstock Lode, who could look down from Mount Davidson upon the bustling swarms on American Flat. At length their rising indignation could no longer be held in check, and on the 29th of September, 1869, strong deputations from the miners' unions of Virginia City and Gold Hill, about 350 men all told, headed by their respective officers, marched upon the Chinese camps near the Overman Mine. The column halted, and the sheriff of Storey County seized the opportunity to read a proclamation to the men commanding them to disperse. The president of the Gold Hill Miners' Union replied, urbanely, that the unions would obey the order as soon as they had done what they "had started in to do;" whereupon his followers cheered so loudly that the deputy sheriff proceeded to read the riot act. When he had finished reading three cheers were given for the "United States," and the miners marched away laughing, while a drummer beat a lively quickstep and a fifer blew defiantly. To such men proclamations and riot acts were as idle wind. Everywhere, as they approached, the Chinese threw down their spades and picks, ran to their huts, gathered up their baggage hastily, and deserted their camps, many flying to the nearest hills. Having thus routed the enemy without bloodshed, the miners returned home with flying colors.[1] They had shown the will and the power to override the law on the Comstock Lode so clearly that no one thought seriously of resisting their resolution, and though the Chinese returned to work, after a compulsory respite of eight days,[2] they were allowed to do so only as a privilege and not as a right. This concession was obtained by Mr. Sharon, after an earnest and forcible plea to the members of the unions, setting forth the benefits which they would gain from the completion of the railroad, and showing the necessity of employing cheap labor in its construction. "When it is completed," said he, "the Chinese are no longer wanted and can go;" yet he only carried his point by signing an agreement which barred him from employing Chinese within the limits of Virginia City and Gold Hill.[3]

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[1] Territorial Enterprise, May 29, 1869.

It is evident that the editor of the Gold Hill News was not far wrong in calling labor king in Washoe, and no one revolted openly against its rule. By the encouragement and support of the miners, unions of mechanics were built up and maintained until all branches of skilled labor in the mines and on the surface of the district had arbitrary rates of wages. Naturally the miners' unions were satisfied with their position. They feared no overt attacks, and they shrewdly contrived to forestall the action of the mine superintendents which had sapped the foundations of the early league. As soon as they noticed that their members appeared to be in disfavor with the mine managers, and were gradually discharged to make room for miners who were not union men, they determined to protect themselves.[1] Accordingly, they held a special meeting and passed a resolution declaring that no laborer should be employed in any mine of the district longer than one month, unless he was a member of one of their unions.[2] Thus they not only fixed an arbitrary rate of pay, but they also divided the whole wages fund among their own members. The latter ordinance was as illegal as the former and even more selfish, but from the union standpoint it was undoubtedly a necessity. Besides, as the number of their members was not limited, and they admitted all worthy applicants to membership, no competent miner was excluded from the privileges of the unions, and they have never prohibited white laborers from entering the district. It is true that they have sometimes discouraged immigration, but only at periods when many of their own members were idle and even obliged to leave the district in search of employment.

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[1] Gold Hill News, September 29, 1869; Territorial Enterprise, September 30, 1869.

[2] San Francisco Evening Bulletin, October 8, 1869.

[3] Gold Hill News, October 7, 1869.

From the stand-point which the members of these unions occupy, of personal interest exclusively, their course in exacting the highest possible payment for their services was probably sagacious. They had the will and the power to be selfish, and they have succeeded in maintaining their income unimpaired, while laborers in other districts have been obliged to accept lower wages. They style their domineering requisition the maintenance of the principle that a fair day's wages should always be paid for a fair day's work, apparently ignoring the fact that they have constituted themselves sole judges of their own claims and sole arbiters to fix the amount of a fair day's wages. Four dollars per day may be fair wages, as they assert, but no laborer has a right to compel his employer to pay this, or any other fixed sum which he may see fit to name, as suitable compensation for his services. The miners' unions on the Comstock Lode are unworthy champions of the labor cause, for they substitute might for right, and place personal interest in the room of justice. There is no question here of self-preservation, but rather of self-aggrandizement, and it is a disgrace to the Washoe district that such despotism should have existed within its limits for fourteen years without one effective revolt. Their unwarrantable action, however, has made the Comstock Mines a most interesting field of industry to the student of political economy.

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[1] B. Colgan, Secretary of the Miners' Union, Virginia City, 1880.

[2] Territorial Enterprise, September 7, 1877. Order took effect September 10, 1877.

An authorized spokesman of the union defends the arbitrary reduction of the best workmen to the level of the poorest on the common plea that any laborer who is fit to work in the mine levels deserves to receive four dollars per day, and if the ablest miners cannot command larger wages the unions cannot be justly reproached. If the arbitrary standard was abolished, he did not believe that the wages of any would be increased, but was confident that the pay of the majority would be diminished. It was true that the number of employés might be enlarged in this event, but he did not consider the benefit to the additional force thus hired a sufficient offset to the injury which the working body of miners would suffer. The unregulated operation of the law of supply and demand tended, in his judgment, to the certain degradation of the laboring classes, and if the artificial barrier built up by the unions was once thrown down, it was impossible to predict how urgent the demand for cheap labor might be. When the mines were unproductive, their managers would probably hire the cheapest labor in the market, and an influx of Chinese might drive the white miners from the district.[1] This plea is evidently an excuse for the position taken by the union rather than a valid defense of it. Any laborer in this country, of whatever color or race he may be, has a right to offer his services at any price, and no man or body of men can justly deny him this privilege; nor can an employer be lawfully prohibited from using his own discretion in the selection of laborers. It is idle to dispute these propositions or to defend any trade union which contravenes them. Sympathy should never be a cloak for injustice. It is one thing to abet all clear-sighted endeavors to improve the condition of the laboring classes, to urge the extension of education, to foster an honorable pride, to identify more closely the interests of employers and workmen, to press the reference of disputes to competent arbitration, to support well-planned "strikes" as a last resort, and even to limit immigration by legislative action; but it is a very different thing for a partisan guild to fix their own wages, brow-beat their employers, and exclude other laborers from the district which they control. Yet this is precisely what the miners' unions of Washoe have done.

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[1] B. Colgan, Secretary of the Miners' Union, Virginia City.

The conditions which have made feasible the maintenance of an arbitrary standard of wages, the effect on the development of the lode thereby occasioned, and the comparative condition of the body of miners thus paid deserve careful consideration.

Why is it that the miners' unions on the Comstock Lode have been able to secure and maintain a rate of wages largely in excess of that paid in most districts of the Great Basin and Pacific slope? A number of causes have contributed to this result. The mines were discovered at a time when wages on the Pacific coast were higher than they are at present, and the payment of four dollars per day to an ordinary laborer was not exceptional in districts where the cost of living was as great as it was in Washoe in 1860. During the years which followed custom confirmed this rate, as surrounding districts were yet unexplored, and men who could not obtain employment at these wages in the Comstock Mines wandered off to other fields, where the promise of equal or better returns attracted them. While other mining districts had usually a short-lived prosperity, the Comstock Lode remained continuously productive, and it was possible to build up there a miners' union which would not be dissolved in a few years by the necessities of adversity. The comparative stability of the district permitted, therefore, the continuance of a rate which owed its origin to a temporary relation between the labor supply and demand. Now the ore-bodies of the productive mines were so concentrated and rich that the margin of profit was great even when the extraordinary cost of extraction was deducted, and their owners could afford to pay the wages demanded; but with the barren mines of the lode the case was different. Here there was no return for the outlay of capital, and stockholders could not fairly be expected to pay exceptional wages; yet as the connection between the productive and barren mines was so close, a rate which the former could alone afford to give was exacted from the latter without any basis of justice, but simply through the chance relation of proximity; for it was repeatedly demonstrated that the occurrence of an ore-body in one section of the lode afforded no assurance that a similar body would be found in another section, and to prospect a barren mine at an exorbitant cost is a rash speculation wherever the mine may be located. If the owners of the barren mines had been ordinary men of business they would not have submitted to this unreasonable tax, but would have obtained a readjustment of wages or discontinued their profitless undertaking. If no work had been done in the barren mines except as much as was requisite in order to retain a clear title, the upholders of an arbitrary standard of wages would have realized their mistake. Some extremists rashly challenged this measure by asserting, like the editor of the Enterprise, August 16, 1864,[1] that the miners could better afford to see the mines closed than to submit to a reduction of their wages. This was sheer folly, for labor has no right to demand that all the risks and sacrifices shall be borne by capital, and this concession can only be extorted under exceptional circumstances. Such exceptional conditions existed in the Washoe district, because the silver and gold mining industry differs from all other industries in the magnitude of its risks and rewards, and because the body of shareholders in the Comstock mines had peculiar notions in regard to the management of their property.

Mining is, perhaps, the only business pursuit in which men stake large fortunes on the acquisition of prizes against the balance of probabilities. It is certainly the only business undertaking where skill, energy, foresight, and industry, aided by ample capital, will not command a measure of success. The distribution of ore-bodies in a lode cannot be determined in advance of their discovery, and until the unseen bonanza is pierced the most systematic and persistent search is based on sanguine hopes rather than reason. When men are gambling thus daringly, ordinary economies of business management are often looked upon as petty details. A penny saved is by no means the same to them as a pound earned. The risks which they brave are so great that they value lightly the expedients of prudence, and they do not always demand, therefore, that the laborers in their employ should contribute in any way to lessen their loss when their outlay continues without return. Yet such a contribution in the form of reduced wages would not be an unfair exaction, as the laborer shares none of the risk and reaps a share of the benefit in the form of profitable employment if an ore-body by chance is laid open. In the case in question of the laborers in the Comstock mines, no reduction of wages strictly speaking was called for.

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[1] Territorial Enterprise, August 16, 1864.

It was clearly pointed out by the president of the Hale & Norcross Mining Company, in his report to the stockholders for the fiscal year ending March 2, 1871, that no undue advantage was sought by the capitalists in urging a readjustment of wages after the completion of the Virginia & Truckee Railroad, for the cost of supplies was so materially diminished by the new freight tariff that everything required for domestic comfort could be had at prices varying from twenty to fifty per cent. less than in the early years of mining on the lode, when the standard of wages was established. But while all other expenses of mining had been reduced the cost of labor remained disproportionately high. The comparative figures given in this report are interesting.

	1867.	1870.	REDUCTION.
Cost of timber per M........	$31.32	$21.32	31.92 per cent.
Cost of wood per cord......	15.05	11.33	24.71 per cent.
Cost of milling per ton.....	14.21	11.16¼	21.42 per cent.
Total	$60.58	$43.81¼	27.67 per cent.
Yield of ore per ton.........	$34.14	$25.13	26.10 per cent.
Cost of labor per day......	4.00	4.00	....

The decline in the value of the ore per ton was so marked that, unless the cost of production had fallen correspondingly, the operations for the years 1870 would have been carried on at a loss. Comparison between the reports for the years 1866 and 1870 is instructive, as the profits of stockholders during each year were nearly the same.

	1866.	1870.
Number of tons reduced	28,635[illegible]	64,974$\frac{18}{100}$
Average value per ton	$47.32	$25.13
Cost of production per ton [1]	29.67	18.64
Aggregate dividends, profit	$490,000.00	$536,000,00

[1] Including office and contingent expenses.

It is evident by this official showing that if the cost of production had not decreased $11.03 per ton, or 37$\frac{17}{100}$ per cent., the trustees of the Hale & Norcross Company must have called for assessments amounting to $294,982.14 in 1870, instead of paying the dividends declared, or in other words, that a saving of $830,982.14 was thereby effected; but in this saving, as Mr. Flood declared, "labor could claim no participation;" for it was clearly brought about by more economical management and the aid of the railroad company. Yet it was argued, in face of this showing, that the profits of stockholders were still so large, equaling an average monthly interest of over 5½ per cent. on the accepted value of their shares, $100, that no reduction of wages was necessary or just. To this plea Mr. Flood opposed an effective rejoinder in the following summary:

Considering the Hale & Norcross Mine a fair representative of the better class of productive mines, which it assuredly was, he compared an investment in the shares of this mine with an investment in real estate, viz: Assuming the average value of the Hale & Norcross stock to be $100 per share, the value of the mine would be $800,000.

This amount, invested in real estate in 1861, when the company was incorporated, at 1 per cent. per month,[1] would give in ten years, as a return for the investment		$960,000
Contra.		
Dividends paid by Hale & Norcross Company	$1,518,000	
Less assessments collected	610,000	
Net profits of the company in ten years		$908,000
Balance in favor of real estate		$52,000

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[1] The ordinary rate in California.

He further urged, with great force, that while real estate nearly always increased in value with lapse of years, mining property became more exhausted and less valuable, until, finally, the cost of production would exceed the yield, and the property would be necessarily abandoned. This plain business statement cannot be confuted, and its apparent conclusion was emphasized by the subsequent record of the mine, for only one dividend has been paid since the president presented this report, and this, a small one of $80,000 in 1871, was offset during the same fiscal year by three assessments aggregating $200,000. Since 1871 the mine shares have been merely a speculative investment. It is true that a better showing might be made in the encouragement of mining investments, and justly, also, by presenting the same figures, as follows:

Amount paid for mining claim by capitalists forming the Hale & Norcross Mining Company, in 1861	$20,000[1]
Amount of assessments paid, 1861 to 1871 (1 to 33)	610,000
	630,000
Dividends paid, 1861 to 1871	1,518,000
Profit	$888,000

Equal to 440 per cent. annually on the original investment; or, assuming that the assessments (1 to 29) were paid at the rate of $70,000 annually during the five years, 1861 to 1865, inclusive ($350,000 having been paid during fiscal years from date of organization of company until March 20, 1866),[2] the profit in dividends would be more than 23 per cent. annually upon the original investment, with its successive additions, viz:

Interest on $20,000 (original investment) for 10 years, at 23 per cent.	$46,000
Assessments 1 to 29, from 1861 to 1866.	
Interest on $70,000 for 10 years, at 23 per cent.	161,000
Interest on $70,000 for 9 years, at 23 per cent.	144,900
Interest on $70,000 for 8 years, at 23 per cent.	128,800
Interest on $70,000 for 7 years, at 23 per cent.	112,700
Interest on $70,000 for 6 years, at 23 per cent.	96,600
Assessment 30, levied in 1867.[3]	
Interest on $60,000 for 4 years, at 23 per cent.	55,200
Assessments 31, 32, 33, levied in 1868.[4]	
Interest on $200,000 for 3 years, at 23 per cent.	138,000
Total	$883,200

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[1] A liberal estimate.

[2] Sixth Annual Report, Hale & Norcross Silver Mining Company, 1867, p. 5.

[3] Seventh Annual Report, p. 14. *Ibid.*

[4] Eighth Annual Report, p. 18. *Ibid.*

In this account, moreover, no allowance is made for interest accruing upon the dividends from date of payment, which would considerably increase the percentage of profit. It is immaterial, however, in this connection, whether the original stockholders had derived 12 or 23 per cent. from their investment. The question at issue in 1871 was whether the prospective profits would justify stockholders in paying more than the market rates for labor, at the dictation of the Miners' Union. Upon a fair examination of the condition of the Hale & Norcross Mine in 1871, this question must be answered in the negative. Prudent and independent mine-owners would have insisted upon a readjustment of wages, and have closed their mine, if necessary, to enforce their demand; but the shareholders in the Comstock Mines have been, as a body, reckless stock-speculators rather than prudent mine-owners. The idea of overseeing the management of their property or inspecting closely its details rarely entered their minds; and if this duty was suggested to them they shunned its discharge as an irksome and preposterous task. They were not buying mines daily in the exchanges, but mining-stocks—a very different purchase in their eyes. They desired to manage stocks, to control their rise and fall, and to create fictitious rather than real values. To produce paper bonanzas was easier and pleasanter work than to delve for ore-bodies; so they shook off the burdens of mining as far as possible upon the shoulders of others, and while they could blow and break bubbles cared little for the true interests of the Comstock Lode. As long as stock-gaming was active in San Francisco the gamblers did not concern themselves about such unimportant matters as the mismanagement of their mining property or the proper wages of their employés. They did not know whether the pay was too high or too low for the service rendered, and did not care to inform themselves. When assessments were levied the tax was paid with the *sang froid* of gamesters whose ventures are unsuccessful. Owing to the wide distribution of the stock shares, dividends from a productive mine might offset assessments levied to develop a barren one, and the burden of taxation was thus less onerous. Through this division of profits and losses the evil effects of waste and extravagance in the conduct of the mines were felt less acutely by individual owners, and a rate of wages for labor in barren mines was maintained which would otherwise have been impracticable. Wages were sustained, also, like other expenses, by reason of the common speculative fallacy which raised the price of all mines on the lode whenever a new ore-body was discovered in any section. Distant sections were in reality no more valuable, but they were held in higher esteem, and it was possible to levy assessments which before would have been futile appeals for funds. To these props of the artificial standard should be added one without which the others would probably have been insufficient — the moneyed power which carried the mines through the gloomy season of 1870—the Bank of California and its successor as the controlling influence in the district, the chief stay of the depressed fortunes of the lode ten years later, the firm of Mackey & Fair. In the combination of these conditions and agencies will be found the key to the strength of the position held so long by the miners' unions.

It remains to examine what effect this arbitrary standard of wages has had upon mining operations in the Comstock Lode. It can scarcely be doubted that the development of the mines has been impeded by the exceptional cost of labor, and the profits of the mine-owners have certainly been reduced in consequence; yet it is an open question whether these local and personal injuries have not been offset by the impulse given to mining science under the pressure of an urgent demand for labor-saving and cheaply-effective machinery. Whenever the rate of wages is unusually high machinery will be substituted for men as far as possible. The miners' unions which forbade the employment of cheap labor did not prohibit the use of the power-drill, and the superintendents who could not hire Chinese miners made cheap servants of steam, compressed air, and dynamite. The heart of the lode, pricked slowly by hand-drills in early years, was pierced through and through by the diamond-pointed rods which sounded the gangue in all directions, as plummet-lines determine the extent and depth of a water-channel. The first power-drill used in the mines was manufactured by Hotchkiss & Gardner, and put in operation by the Chollar-Potosi Mining Company;[1] but there is little question that the serviceability of these drills was first demonstrated in the Washoe district by the Sutro Tunnel Company. By the aid of these drills the heading was advanced nearly three times as rapidly as it had been excavated by hand-labor under more favorable conditions, and the cost per cubic foot of rock removed was materially diminished.[1] The progress in sinking the Yellow Jacket Mine shaft, 218 square feet in area,[2] is an illustration of the service of these drills in driving a heading vertically. The work was not specially pressed, yet the shaft attained the depth of 2,250 feet in twenty-eight months,[3] showing an advance of 81½ feet per month.[4]

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[1] Andrew Fraser, County Commissioner. Virginia City, Nevada, 1880.

In the Spring of 1868 giant-powder cartridges were tried in the Gould & Curry Mine with and without tamping, but, from some cause, proved unsatisfactory, not rending the rock as well as ordinary blasting-powder.[5] This early failure was due, in all probability, to the character of the rock or inexperience in the use of dynamite, for, a few months later, a very favorable report of its serviceability was given.[6] The miners had become expert in inserting the cartridges properly, and in blasting the hard rock which the Ophir Mine shaft was then piercing its superiority was evident. Thenceforward, in general prospecting work, dynamite in the form of giant and Hercules powder has commonly been used, though for rending decomposed ore ordinary blasting-powder is preferred. Efforts were made, also, to utilize electricity in various ways, but with only partial success. The first under-ground wire line in the mines was laid in April, 1868, through the shaft of the Savage Mining Company, and used for striking signal-bells in the hoisting-works. Connection was made with every station in the shaft, and signals sounded by pulling a ring attached to a hanging wire.[1] It was found, however, that the apparatus could not be relied upon with certainty at all times, and it was replaced by the ordinary bell-cord. For exploding cartridges electric batteries are sometimes used, but except in the Sutro Tunnel, where it was desirable to explode a considerable number of cartridges simultaneously, the electric spark has not commonly been substituted for the time-fuse.

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[1] Rate of progress by hand-labor, 3.30 feet per working day since the work of excavation was begun. Rate of progress by machine-drilling, 9.54 feet per day from date of actual substitution of machine for hand-drilling. Relative area of heading-face, 50 square feet (for five-sixths of the total length driven by hand-drills): 123¼ square feet.—Geo. J. Specht, C. E., Sutro Tunnel Company.

[2] Albert Williams, jr., Special Agent, Tenth Census, 1880.

[3] Begun October 7, 1876.

[4] John A. Church, E. M.; The Comstock Lode, p. 14.

[5] Territorial Enterprise, April 18, 1868.

[6] *Ibid.*, July 19, 1868.

The most important saving has been made in perfecting the hoisting and pumping engines. Although the flume-lines and railroad have poured a constant supply of fuel into the mines the cost of wood has been a principal item of expense, and unremitting efforts have been made to increase the efficiency of the fuel consumed. No noteworthy improvement has yet been made in boiler-setting,[2] though various devices have been tried repeatedly; but by the enlargement of the working-plant a considerable saving has been effected, as large machinery, in most instances, requires less fuel in proportion to the power developed than lighter machinery. The extraordinary duty imposed upon the pumping-engines has been noted already. Those constructed during the past six years, with scarcely an exception, have been compound engines, with the Davy differential-valve gear, modified by Mr. W. H. Patton.[3] In 1875 the first direct-acting hoisting-engine was erected upon the lode by W. H. Patton, constructing engineer for the Consolidated Virginia Mine; and since that year several similar engines have been placed at different shafts on the line of the lode. As the cable-reels are keyed to the main shafts of these engines it is evident that cages can be hoisted and lowered more rapidly than when geared shafting is used. The hoisting-speed has been increased to from 30 to 35 feet per second, and the direct-acting engines at the C. & C. shaft can lift at an average rate of 45 feet per second, or 2,700 feet per minute, if necessary.[4] This rate is from five to six times greater than that attained in 1866, and nearly double that reached by the geared engines still in use at some shafts. In several of the shafts ore and waste are raised to the surface in self-dumping skips or ore-buckets called "skeets," holding 4½ tons.[1] By the substitution of these skeets for the heavy four-decker cages the dead-weight which must be lifted is considerably diminished, and the labor of handling the cars at the surface is also saved.

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[1] Territorial Enterprise, April 5, 9, 1868.

[2] W. R. Eckart, C. E.

[3] "The Comstock Lode," p. 16; John A. Church, E. M.

[4] W. R. Eckart, C. E.

The maintenance of a relatively high rate of wages has been advantageous, of course, to the body of working miners of the union. Discharged and unemployed men have suffered from time to time during periods when the mining industry was depressed, but, owing to causes before stated, the wages fund has been lavishly supplied since the opening of the mines, and seasons of grave distress have been short until recently. A careful comparison shows that there is no mining district in the world where the general condition of the laboring class has been better during the past twenty years than on the Comstock Lode. Nowhere has so large a guild been their own paymasters for so long a time, and in no mining district are more varied and excellent supplies offered for sale to men who can afford to buy, not only the necessaries of life, but its luxuries as well. Choice cattle, fatted on the succulent grasses of the Truckee meadows, are slaughtered for their tables. Fresh vegetables from the valley of the Carson are brought daily in their season to the mines. Venison from the sierran foot-hills, plump wild-fowl from the Californian estuaries, and fish, which twenty-four hours before had been swimming in sea or river, can be seen in profusion on the market stands of Virginia City. Strawberries, apricots, pears, peaches, grapes, apples, figs, and all other products of the luxuriant gardens and vineyards which are the boast of the Pacific seaboard cover the counters of the open stalls in luscious heaps. The demand of moneyed customers has made the Virginia and Truckee Railroad an unfailing cornucopia of dainties.

The following table of supplies brought by rail to Virginia City and Gold Hill during the years 1876 and 1879 gives the most accurate information in regard to the quantity and quality of food consumed:

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[1] The invention of Mr. I. L. Requa, Superintendent of the Chollar Mining Company; "The Comstock Lode," John A. Church, E. M., p. 16.

Articles.	Virginia, 1876.	Virginia, 1879.	Gold Hill, 1876.	Gold Hill, 1879.	Articles.	Virginia, 1876.	Virginia, 1879.	Gold Hill, 1876.	Gold Hill, 1879.
	Lbs.	Lbs.	Lbs.	Lbs.		Lbs.	Lbs.	Lbs.	Lbs.
Apples	537, 157	705, 677	48, 451	84, 210	Stoves	220, 690	11, 365	29, 978	19, 158
Beans	97, 368	114, 103	27, 494	10, 348	Organs	12, 426	6, 600		1, 135
Bacon	157, 565	112, 947	41, 614	25, 240	Pianos	75, 965	58, 401	8, 535	3, 240
Butter	354, 167	326, 854	99, 060	42, 827	Sewing mach's	61, 897	32, 641	8, 200	1, 190
Crackers	187, 013	199, 819	57, 005	39, 789	Rubber goods	81, 239	45, 217	29, 296	18, 558
Coffee	161, 413	170, 119	33, 528	24, 495	Beer	1, 187, 698	1, 121, 887	26, 078	7, 505
Cheese	96, 231	78, 141	26, 883	11, 064	Cider	92, 770	65, 191	20, 305	13, 550
Candles	487, 007	571, 477	330, 759	153, 615	Ale	202, 251	84, 321	181, 865	33, 208
Candy	69, 840	62, 950	19, 328	11, 524	Porter	188, 661	128, 551	46, 050	28, 192
Canned goods	958, 626	686, 596	296, 755	138, 436	Claret	95, 673	84, 024	10, 106	5, 625
Eggs	1, 045, 019	823, 176	123, 021	108, 347	Port	30, 000	12, 936	3, 695	3, 615
Dried fruit	118, 414	158, 142	31, 488	14, 125	Champagne	80, 387	56, 189	3, 805	900
Oranges	65, 823	158, 125	10, 325	8, 885	Sherry	25, 118	21, 467	3, 140	1, 878
Pears	60, 225	30, 872	19, 600	3, 401	Brandy	106, 472	68, 031	31, 735	10, 964
Vegetables	1, 140, 328	907, 072	149, 359	93, 688	Bitters	35, 818	41, 922	4, 675	2, 801
Flour	4, 002, 657	3, 445, 623	1, 110, 893	607, 977	Wines	364, 309	194, 061	58, 245	20, 236
Ham	490, 901	560, 116	121, 329	84, 186	Gin	50, 370	57, 671	13, 325	9, 760
Hops	53, 166	13, 935	4, 995	3, 534	Rum	23, 853	17, 401	4, 000	4, 190
Lard	215, 499	201, 151	64, 134	54, 678	Whisky	819, 197	716, 732	208, 783	108, 034
Lemons	11, 562	16, 924	1, 897	2, 215	Spirits	48, 510	30, 095	6, 819	2, 940
Limes	43, 627	52, 390	4, 913	2, 075	Miscel's liquors	217, 536	103, 881	47, 365	
Fruit	2, 129, 716	1, 174, 596	187, 660	217, 955	Vermouth	5, 925	385		300
Grapes	77, 545	106, 152	4, 980	8, 614	Calves	143, 483	35, 002	1, 642	5, 030
Milk	7, 950	265, 870	745	240	Fish	304, 309	309, 630	89, 956	43, 301
Potatoes	2, 542, 138	715, 684	341, 403	140, 806	Hogs	997, 578	311, 479	183, 510	183, 945
Pickles	89, 413	113, 137	29, 832	10, 437	Poultry	316, 590	214, 866	29, 940	21, 753
Castor oil	28, 524	12, 982	20, 645	7, 930	Pork	54, 768	109, 096	15, 228	6, 322
Olive oil	18, 202	13, 265	5, 765	2, 175	Oysters	88, 735	125, 572	23, 301	13, 402
Linseed oil	125, 997	19, 660	17, 568	11, 738	Fuse	32, 986	43, 720	11, 115	7, 874
Onions	202, 590	69, 836	27, 741	9, 590	Mining mach'y	6, 723, 265	4, 609, 338	3, 414, 962	1, 301, 017
Rice	381, 526	334, 529	69, 396	55, 620	Powder	341, 952	435, 804	125, 554	84, 515
Sugar	1, 313, 367	114, 529	355, 113	178, 619	Nails	779, 323	292, 217	188, 867	160, 225
Soap	195, 700	1, 143, 629	55, 791	16, 300	Nuts	43, 058	23, 162	17, 181	7, 352
Tea	101, 878	110, 549	30, 210	17, 399	Shovels	35, 128	19, 882	21, 632	9, 369
Tobacco	126, 860	97, 999	30, 867	14, 687	Pipe	1, 453, 750	689, 593	329, 719	314, 215
Cigars	111, 580	87, 464	28, 641	12, 037	Iron	6, 257, 929	1, 485, 644	2, 390, 421	888, 275
Boots and shoes	162, 123	123, 104	36, 381	19, 030	Matches	12, 904	10, 390	3, 437	2, 200
Clothing	82, 362	160, 621	40, 530	12, 660	Coal oil	619, 511	716, 722	232, 675	131, 965
Dry goods	177, 048	270, 845	77, 235	74, 065	Lard oil	333, 105	852, 519	81, 934	41, 535
Hats and caps	16, 558	17, 977	6, 670	2, 645	Lubricating oil	30, 215	68, 080	3, 505	56, 959
Furniture	1, 694, 719	326, 541	144, 291	58, 100	Nut oil	9, 925		570	
Glassware	433, 067	126, 173	65, 893	54, 917	Miscellan's oil	240, 240		42, 907	71, 282
Hardware	1, 617, 191	1, 526, 554	369, 877	249, 173	Steel	231, 673	83, 026	154, 022	99, 740

Compiled from way-bills of Virginia & Truckee R. R. Company by Special Agents of Tenth Census.

The supply of milk is largely in excess of the figures given above, for there are eleven dairies in and near Virginia City, where 363 cows were milked daily during 1880 for the service of the towns on the lode. By these dairies about 900 gallons of milk were furnished daily, at a charge of from 40 to 80 cents, in proportion to the amount consumed. The average cost ranges from 56 to 62½ cents, and a large quantity is delivered to customers by the pint and quart at $2.50 and $4 dollars per month, respectively. At the restaurants of Virginia City, 22 in number, the price of board per week ranges from $5 to $10, the ordinary rate being $1 per day. The food served is of excellent quality and well cooked.

Prices Current, Virginia City, 1880.

Articles.	Price.	Articles.	Price.
Chickens per doz.	$10.00	Salmon, smoked per lb.	$00.12½
Chickens single	75 to 1.00	" canned per doz. cans	2.50
Turkies per lb.	20	" " 2½-lb. " "	3.50
Geese "	25 to 30	Crackers, soda per lb.	8
Ducks each	1.00	" butter "	12
Quail per doz.	1.75	" Boston "	12
Flour per 100 lbs.	3.25 to 3.75	Apples, dried, by bbl. "	11
Corn meal "	4.00	" " retail 7 lbs.	1.00
Oat meal "	6.50	Prunes per lb.	20
Buckwheat "	7.50	Butter, firkin, California and Nevada. "	32
Cracked wheat "	6.50	" fresh roll 2-lb. rolls	75 to 1.00
Cracked hominy "	7.50	Potatoes 100 lbs.	2.00
Sugar, crushed, by bbl per lb.	14¾	Cabbage "	2.50
" " " "	14¼	Cauliflower per doz.	1.50
" " by box "	30	Celery "	1.25
Sugar, yellow, by bbl "	13	Strawberries per lb.	15 to 35
" " per ½ bbl "	13½	Blackberries "	12½ to 25
Pork, California per ½ bbl.	16.50	Raspberries "	12½ to 25
" Eastern "	16.50	Apples "	3 to 10
" per lb.	20	Cherries "	6 to 25
Mackerel ½ bbl.	16.50	Plums "	6 to 15
" kits.	2.50 to 2.75	Grapes "	5 to 10
" 6 to 8 for	1.00	Pears "	5 to 7
Lard, Eastern 10-lb. cans	1.75	Peaches "	6 to 25
" " 5-lb. "	87½	Apricots "	6 to 25
Lard, California 10-lb. "	1.50	Beans 100 lbs.	5
" " 5-lb. "	87½	Peas "	5
Salt, Eastern 50-lb. sacks	1.75	Pears, dried "	6
" " 20-lb. "	62	Peas, per case 2 doz. 2-lb. cans	5.25
" " 10-lb. "	37½	Corn " " "	5.25
" " 5-lb. "	25	Tea, Japan per lb.	33 to 40
" " 3-lb. "	15	" green "	1.00 to 1.25
Cheese, California, wholesale per lb.	19	" English breakfast "	75
" " retail "	25	Coffee, Java "	30
Cheese, Eastern, wholesale "	30	" Costa Rica "	25
" " retail "	40	Soap, laundry per box, 20 bars	75 to 1.00
Oysters doz. 2-lb. cans	3.25	" castile per lb.	16
" 5-lb. "	1.00	Whisky per gall.	2.00 to 5.00
Pie-fruit 1 doz. cans, 8 lbs. each	8.00	Brandy "	3.50 to 8.00
" assorted per case	5.25	Gin, Swan brand "	5.00
Tomatoes 1 doz. 8-lb. cans	7.50	Port Wine "	2.50 to 4.50
" 2 doz. 2½-lb. "	5.00	Raisins, California 20 lbs.	2.50
Jellies, assorted 2 doz. 2-lb. "	6.50	" Malaga 25 "	4.00
Rice, wholesale 100 lbs.	11.00	Candles per box.	3.25 to 4.00
" retail per lb.	14	Lobsters, 1-lb. cans per doz.	2.75
Sirup 5-gallon kegs	5.00	" 2-lb. " "	3.25
" 1-gallon "	1.25	Oranges "	37½ to 50
Bacon, Eastern 100 lbs.	18.00	Limes "	25
" California "	17.00	Lemons "	62½
Ham, Dupey per lb.	18	Green peas per lb.	20
" California "	15	Asparagus "	15
Cod-fish, Eastern "	10½	Lettuce per head	25
" California "	8½	Tomatoes per lb.	25

Prices and rents.

ARTICLES.	Jan. 1, 1864.	Jan. 1, 1871.	Jan. 1, 1881.
Flour, per 100 lbs	$8 to $10	$5 to $6	$4 to $4½.
Meal, per 100 lbs			
Sugar, per lb	26 and 28 cts.	16 and 18 cts.	12 to 15 cts.
Butter, fresh roll, per lb	$1.25	$1 and 37½ cts.	50 cts.
Butter, firkin, per lb	75 cts		
Coffee, per lb	50 cts	40 cts	20 to 30 cts.
Tea, per lb	75 cts to $1.50.	75 cts to $1	50 to $1.
Rice, per lb	12½ to 15 cts		10 to 12½ cts.
Beans, per lb	12 to 15 cts	8 to 10 cts	8 to 10 cts.
Potatoes, per lb	6 cts	5 and 6 cts	2 cts.
Dried apples, per lb	37½ cts	20 cts	7 to 10 cts.
Codfish, dried, per lb	20 cts	15 cts	10 to 15 cts.
Bacon, per lb	30 cts	22 cts	20 cts.
Salt beef, per lb	20 to 25 cts		12½ cts.
Fresh beef, per lb	15 to 25 cts	12½ to 25 cts	10 to 25 cts.
Candles, per lb	30 cts	25 cts	12½ to 15 cts.
Blankets, per pair	$12 to $15		$8 to $10.
Liquors—			
Brandy, per gal	$4 to $10	$4 to $10	$4 to $10.
Whisky, per gal.	$2 to $6	$2 to $6	$2 to $6.
Rum, per gal	$3 to $5	$3 to $5	$3 to $5.
	1864.	1871.	1881.
Rent of cottages or tenements—			
Three rooms, per month	$25	$20	$5 to $10.
Six rooms per month	$30	$25	$10 to $15.
Rent of single room, per month.	$20	$16	$3 to $10.
Cost of board and room, per month.	$45 to $50	$40 to $45	$30 to $35.
Restaurant charges—			
Per week	$10	$8	$7.
Per meal	75 cts. and $1.	50 and 75 cts.	25 to 50 cts.

If the working miners care to walk the streets in broadcloth suits and to wear gold chains, watches, and rings, they can so bedeck themselves if they choose. Few, however, are inclined to spend their wages in costly clothes or jewelry. If they have any little vanity it is shown in shapely trousers of fine cloth and well-made shoes of the best leather. Plain, substantial, sober-colored suits are generally worn, excellent in material, though not faultless in fit; still their street clothing has a better appearance than the holiday dress of the average American laborer, as it is discarded usually before it becomes threadbare and faded. The quality and cost of clothing sold in the city is shown in the following table:

READY-MADE CLOTHING—PRICE LIST.

Men's working coats	$3.00	@	$3.50
Men's cassimere "	5.00	@	10.00
Men's diagonal "	8.00	@	13.00
Men's black dress "	14.00	@	20.00
Men's heavy Chinchilla coats	6.00	@	12.00
Men's trousers (good quality)	3.00	@	6.50
Men's trousers (best)	4.00	@	8.00
Men's trousers, black beaver	4.00	@	7.00
Men's trousers, doeskin	6.00	@	10.00
Men's trousers, diagonal	3.00	@	7.00
Men's waistcoats, cassimere	1.50	@	3.00
Men's " bl'k doeskin	2.50	@	5.00
Men's " diagonal	1.50	@	3.00
Overcoats—Chinchilla	6.00	@	20.00
beaver	6.00	@	22.00
rubber	5.00	@	00.00
Underwear—extra heavy Canton flannel shirts and drawers, each	1.00	@	1.50
merino knit shirts, best quality, doz	5.00	@	18.00
red flannel shirts, best quality, doz	9.00	@	18.00
Underwear—Shaker flannel shirts, best quality, doz	$12.00	@	$16.00
heavy cassimere overshirts, per doz	9.00	@	18.00
heavy woolen over-shirts, per dozen	12.00	@	24.00
White shirts—New Jersey Mills, muslin, linen cuffs, fronts, and collar bands, each	2.00		
Cheviot dress shirt, per dozen	7.00	@	21.00
Percale, per dozen	6.00	@	14.00
Hosiery—white cotton socks, best, per dozen	2.00	@	3.00
Lisle-thread socks	3.00	@	5.00
Shaker wool and cotton socks	2.50	@	4.00
fancy hose	3.00	@	8.00
Clothing made to order--summer and winter suits:			
American cloth	45.00	@	55.00
French and English cloth	55.00	@	65.00
Overcoats—American cloth	35.00	@	45.00
Imported cloth	50.00	@	55.00

The miners' houses are even less pretentious than their dress; yet the plain cabins and cottages, sometimes neither whitewashed nor painted, and decidedly inferior externally to the same class of dwellings in a New England village, are furnished with all the home comforts which the miner needs or desires. Beds, stoves, and other furniture are excellent of their kind, and when a woman has charge of the house the somewhat barren rooms are often transformed into cosy lodgings by bright-colored curtains, soft carpets, prettily-figured wall-paper, and the hundred lesser additions which, in tasteful combination, make even a rude cabin interior pleasing to the eye. The unmarried miners live commonly in lodging-houses, of which there are 22 in Virginia City; 6 are built of brick and the remainder of wood. They are plain buildings, two and three stories in height, with an average floor-surface of 45 by 75 feet. A hall from 6 to 8 feet in width extends through the house usually, with apartments on each side. Most of the rooms are simple dormitories, averaging 10 by 12 feet in size, but the connected rooms or suites are considerably larger. There are in all 550 single rooms and 110 suites, with accommodations for 945 persons. These apartments are all carpeted and comfortably furnished according to the requirements of the lodgers. No furnaces or steam-heating apparatus are in the buildings, but the rooms are warmed, if desired, by stoves. For lights candles or coal-oil lamps are used—generally the latter—the high price of gas barring its introduction from the street-mains. The arrangements for ventilation are excellent. Not more than a dozen rooms in all the houses are without windows, and these have large transoms opening into the central hall. Nine of the twenty-two houses have bath-rooms for general use, and the lack of these in the remainder is fairly attributed to the existence of the commodious, well-fitted baths at the mine-works. Water-closets near all the houses are well constructed and well cared for.[1] In those houses where the inmates are boarded good accommodations can be had at from $8 to $10. Thirty dollars per month is a common rate for board and lodging (1881), and in some houses $5 per week only is charged. These prices are considerably below the rates demanded in 1876–'77, a period of bonanza, the average reduction being probably 30 per cent. The price of lodging, simply, shows a much greater decline, suites being freely offered (1881) for $15 and $20 which were rented four years ago at from $40 to $60 per month.

Well fed, well clothed, and well lodged, the miners are naturally robust and healthy. The atmosphere of the mountain towns is pure and invigorating. During the winter season the cold is sometimes severe, but variations in temperature are less sudden than on the Atlantic seaboard, and the changes are borne without shock or discomfort. Indeed, the climate has been particularly recommended to consumptive patients. Pneumonia, typhoid fever, and rheumatism are the prevalent forms of sickness,[1] but no one of these exists to any considerable extent. During 1871 and 1872, when the heat of the lower mine-levels first became intense and the provision for the health and comfort of the working miners was insufficient, many suffered from pulmonary and rheumatic affections.[2] Transferred in a moment from a torrid to a frigid zone, in the passage from the foot to the mouth of a mine-shaft, they went out from the shaft-works sweating and often half clothed into the keen frosty atmosphere of the mountain slope. It was no wonder that many a man reached his home half choked by acute pneumonia and spitting blood. By heavy doses of quinine, ranging as high as 120 grains in the course of 24 hours,[3] and the free use of stimulants, the acute attacks were generally relieved; but they often terminated fatally, for the miners drank liquors so freely when in health that the remedy of stimulants did not produce its natural effect when they were suffering from pneumonia, and the physicians feared to administer liquor in extraordinary quantities, as the normal action of the liver and kidneys was already deranged by alcohol; but the evil soon wrought its own cure. Taught by experience, the men exposed themselves less heedlessly to changes of temperature, and mine superintendents provided for their health more carefully. More attention was paid to securing systematic ventilation throughout the lode by connecting galleries, and more powerful blowers were used to force fresh air into the prospecting drifts. Well-fitted dressing-rooms and baths were constructed in the hoisting-works for the use of the miners, and the benefit thereby derived was apparent at once.[4]

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[1] Records of Special Agents Tenth Census.

Not only are the immediate bodily wants of the miners well satisfied, but unusual provision is made for the instruction and amusement of the men and their families. Catholic and Protestant churches open their doors to all in the city, and services are frequent. The public schools are exceptionally well conducted, even as compared with New England schools of the same grade. The teachers are well paid, competent as a body, and interested in their work, and the scholars, in consequence, are attentive and responsive, quick to learn, and trained to digest their text-books. No people appreciate the value of a thorough common-school education more fully than the inhabitants of the Comstock mining towns. Even the most ignorant miner is anxious that his children shall have the training which he lacks. Thus, in 1880, only 4 per cent. of the children in these towns between the ages of eight and fourteen were reported as not attending school,[1] and infirm health would probably account for the absence of most of this small minority. The children are conscious of the interest which is taken in their progress and are strongly stimulated by it. Reared among surroundings so remarkable and exciting, they drink in a restless, sanguine temper with their mothers' milk. In the schools they show themselves notably precocious and quick of comprehension, full of animal spirits, but tractable and orderly when the teacher commands their respect. Plodding perseverance is a rare trait with them, however. Too impatient to disentangle knots, they would either cut the cord or throw it aside; still they are not discouraged by obstacles, and if they are kept steadily at work they will usually master all difficulties. Mathematics, geography, and the natural sciences are the favorite studies, and the general proficiency is shown unmistakably by the recitations and written examinations. It may fairly be doubted whether any teaching in the country is more suggestive and successful than in the object-lesson and normal classes of the Gold Hill schools. The appended table presents concisely some interesting data prepared by the superintendent of schools:

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[1] Doctors Grant, Kirby, and Harris, Virginia City, 1880.

[2] Doctor Kirby.

[3] Doctor E. B. Harris.

[4] *Vide* Tables VI, VII, VIII, IX, X, XI, XII, Appendix.

SCHOOL STATISTICS OF STOREY COUNTY,

VIRGINIA CITY AND GOLD HILL.—1880.

Number of school-houses	11
Valuation of school-houses and furniture	$132, 850
Valuation of school apparatus	$2, 600
Number of volumes in school libraries	431
Valuation of school libraries	$1, 060

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[1] Report of Superintendent of Schools, 1880.

Number of mixed-grade schools	2
Number of primary "	28
Number of grammar "	9
Number of high "	2
Total number of "	41
Average daily attendance	2,001
Average number of pupils	2,143
Percentage of attendance	93.4
Number of male teachers	5
Number of female teachers	40
Total number of teachers	45
Average monthly salary male teachers	$154.75
Average monthly salary female teachers	$99.40
Total average salary teachers	$104.10
Total number children under 21 years of age	6,612
Total number children under 21 years of age born in Nevada	3,400
Total number children between 18 and 21 years	177
Total number children under 6 years	2,552
Total number children between 6 and 18 years	3,883
Total number girls between 6 and 18 years	2,004
Total number boys between 6 and 18 years	1,879
Total number children between 6 and 18 years not attending school	763
Total number children between 8 and 14 years not attending school	70
Total number children reported as attending public schools	2,565
Total number children reported as attending private schools	543
Total number attending school	3,008

Nationality, Religion, and Occupation of Parents of Pupils of Public Schools.

Number of parents born on Pacific coast	58
Number of parents born in Western States	249
Number of parents born in Middle States	370
Number of parents born in Eastern States	272
Number of parents born in England	627
Number of parents born in Ireland	1,179
Number of parents born in Germany	273
Number of parents born in other countries	332
Total number of parents	3,360
Total number of parents of Catholic faith	1,768
Total number of parents of Protestant faith	1,391
Total number of parents of no religious faith	204
Number of parents, miners and mill-men	1,950
Number of parents, mechanics	397
Number of parents, professional men	37

The library of the Virginia City Miners' Union consists of 2,000 volumes, selected to suit the tastes of its members by a committee chosen from among their number.[1] Only such books were bought as would be generally read—novels, romances, books of travel, and elementary text-books on mechanics and physics forming the bulk of the collection. The result of this practical system of selection is shown in the appearance of the books on the shelves, thumb-worn and soiled frequently, but none dusty or with uncut pages. For those who are pleased with dramatic entertainments a theatre, seating about 1,300, is open during the greater part of the year in times of bonanza, and less frequently when the yield of the mines decreases. On its stage have appeared most of the noted actors, singers, and musicians who have visited the Pacific coast of recent years, and few audiences are more interested and respectfully attentive during the progress of a play than the oddly-assorted company which fills the opera-house in Virginia City from pit to gallery. Even if the theatre is closed, the staple pleasures of mining towns, drinking, card-playing, and billiards, are never failing. The 100 saloons of Virginia City and Gold Hill sold, in 1880, 75,000 gallons of liquor, chiefly whisky, exclusive of beer and wine.[2] In the six breweries of the county 147,996 gallons of beer were manufactured during the year, and the amount sold reached 225,000 gallons in round numbers—67,800 gallons having been imported from California and about 10,000 gallons from the Eastern States.[3] This is an average of 15 gallons per head for every resident of the county, in addition to the average consumption of 5 gallons of liquor. At "a bit a drink" (12½ cents), the usual price, the cost of the liquor per head was at least $40, and its total cost $600,000, reckoning 64 drinks to the gallon, the saloon estimate. The price of the beer and wine at retail was probably half this sum, so that $900,000 was expended in quenching the thirst of 20,000 people; yet 1880 was called a "dry year" in comparison with 1876. Notwithstanding this miraculous draught, few drunkards could be seen reeling about on the streets or before the bars; for custom has made it a property of easiness to take glass after glass without visible effect, and no intoxicated man is suffered to enter the mines. The strict requirements of the mine superintendents and the personal pride of the miners are strong safeguards against reckless excess. The value of these safeguards and the improved social condition of the city are clearly evident in the criminal record for June, 1880, as contrasted with the record for June, 1863;[1] for the monthly percentage of arrests to population is shown to be .009, or less than one-third of the percentage in 1863, .0285+, and this, too, at a time when the police force was incomparably more efficient and faithful.

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[1] Territorial Enterprise, February 16, 1878.

[2] Records of United States Census Agents, 1880.

[3] *Ibid.*

Criminal Cases and Disposition of Criminals in Virginia City during the month of June, 1880.

[Population 11,000.]

Assault and battery	24
Assault with intent to kill	2
Cruelty to animals	1
Disturbing the peace	11
Drawing deadly weapons	4
Drunk and disorderly	18
Forgery	1
Gambling without license	2
Grand larceny	3
Petit larceny	9
Illegal voting	1
Loitering in saloon	1
Malicious mischief	10
Threatening life	1
Vagrancy	7
Violating city ordinance	5
Guilty	28
Not guilty	70
Held for trial	2
Committed	19
Males	84
Females	16
Total (5 of whom were Chinese)[2]	100

Billiard-rooms and gambling-houses are well patronized, but much less than in times of bonanza, and the houses of ill-fame are half deserted. Even stock-gambling, the absorbing passion of the Washoe miners, is feebly maintained. This is due, of course, to a change of income, not of disposition. With few exceptions the miners have staked their savings on the rise and fall of stocks with singular persistency. None know better than they the emptiness of stock "deals" and the uncertainty of actual "strikes," and none estimate more clearly the power of large operators and the comparative weakness of humble gamblers. None see the odds against them more vividly and yet none accept these odds more readily. Their employment in the mines, with its apparent privilege of inspecting daily the work of development, is on the whole a delusive advantage. They see the walls of the galleries and can judge correctly the value of ore in sight; but they cannot look beneath the surface. Indications are often misleading, and men working in the depths of a treasure-chamber are not likely to calculate its riches coolly and accurately. Their imagination is heated by dazzling visions; possibilities appear probabilities and chances certainties. In spite of a hundred lessons of disappointment they are inflexibly sanguine, and invest commonly in the hope of a change for the better. Even when they know the true condition of a mine, and that a rise in the quoted value of its stock is a mere absurdity, yet they hope to share in the profits of the deal and give their mite to swell the bubble. Such gambling does not make men scrupulous or cautious; they welcome stock flurries, even if they laugh at their inanity, and resolve to profit by every opportunity. Herein lies the secret of their general ill success. Sometimes they win largely and might live comfortably on their gains, but they are never content to leave the stock-exchange, and lose in later ventures what they have won. They speculate too often and hold their purchases too long. The gambling fever is not intermittent, and men whom it possesses are restless except when buying and selling in the stock market. They cannot remain neutral and see bulls and bears contending without discrimination; so they are drawn into the speculative whirlpool and ultimately sink in its vortex. Their disappearance is hastened by their inordinate greed which is not satisfied with 300 or 400 per cent., but demands a fortune for a dollar. Thus few of the Comstock miners have saved any money, although so liberally paid, for the stock-exchange has swallowed up all except the cost of their daily subsistence, and their exceptionally high wages have not been of proportionate advantage to them. This return of surplus earnings to the gambling fund was so certain that a noted mine-owner and stock-operator said with truth that he did not care whether the miners were allowed $3, $4, or $5 per day; for whatever sum he paid out over $3 would come back to his pockets again through the stock-exchange; yet the miners are so fond of stock-gambling that they continue to pay back with one hand what they receive with the other. In this light the difference between their wages and those of ordinary American miners appears sometimes a fallacious allowance, given for their amusement rather than for their use—not so much a benefit as a bauble. However, this disposal of their surplus earnings is a matter which concerns them solely; they have a right to do as they please with their own if others are not injured thereby, and if they choose to squander their earnings none can gainsay them; but they have no right to dispose of what is not their own, to disburse the wages-fund, and to prohibit the employment of labor except at arbitrary rates. The injustice thereby done to the mine stockholders has been pointed out. This the union does not consider or care for; but it is strange that many of its members do not see the injury which they are inflicting upon themselves. They may, indeed, prevent the mining companies from employing any miners except at the rate of $4 per day, but they cannot compel the companies to give work at this rate to all who seek employment. In times of bonanza, when labor is in demand, all the members of the union may be hired as miners; but in times of borrasca the demand falls off and many laborers are discharged. Obviously the least efficient laborers will be the first to lose their places. The secretary of the union may allege that a novice, after a few months' practice, is as serviceable as an experienced miner,[1] but facts do not support his assertion. The unions have not been disposed to establish a scale of wages whereby men may be paid in proportion to their vigor and ability, and in default of this scale only the most expert workmen will be retained when the mining industry is depressed. The best men were receiving, in 1880, as much as $4.75 per day,[1] but ordinary laborers were shut out entirely from service. Now it is of interest to note that the very men who need exceptionally high wages are precisely the ones who fail to get work at all under the ordinance of their unions—that is, men with families are less vigorous, less energetic, less daring, as a body, than the single men.[2] Consequently, in times of borrasca the married men will be dropped first from the roll. It is a simple instance of the survival of the fittest, but it bears hardly on a portion of the union members; those who have most need of the union, and for whose protection it was perhaps chiefly framed, are the ones whom it evidently injures. There are, of course, exceptions to this discrimination; some married men are as competent as any single men, and will be retained as certainly; others, again, though less able, are kept at work from consideration for their families, who would otherwise be left destitute; and instances are known, also, where single men have left the district voluntarily in order to give a better chance of employment to men with families, and working members of the union often allow unemployed members to take a share of their shifts and thus earn a living, for, though the working force is of many different nationalities, the men labor and live together on the best of terms. It is also true that married men cannot afford, as a rule, to leave the district in search of employment, and linger on, earning a precarious living, long after their associates, the bachelor miners, have emigrated to other places. So, finally, when the industry of the district revives they obtain work as the first applicants, and when single men drift back to the district on the report of its reviving prosperity, most of the available positions have been filled, and superintendents do not commonly discharge married men to make room directly for single men, even though the latter are confessedly the better miners.

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[1] See p. 210.

[2] *Vide* Table XIII, Appendix.

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[1] B. Colgan, Secretary of Miners' Union, Virginia City, 1880.

In spite of these checks upon the operation of the Darwinian principle the fact remains that the maintenance of an arbitrary standard of wages has resulted in ostracising the laborer of moderate ability and in building up a guild of the most competent workmen of their class. The miners of the Comstock Lode may challenge comparison with any miners in the world in vigor, intelligence, and skill. They are of many nationalities, but mainly Americans, Irish, and English. Experience has shown that better results are obtained by the employment of men of several nations on a shift or in a level, rather than by making up a working party of men of one nation exclusively. Rivalry supplies an additional incentive, there is less disposition to shirk labor by the secret understanding of a clique, and the distribution of work is somewhat more efficient. Thus Cornish miners, as a rule, excel as timber-men, though in general mine-work Irish and Americans are perhaps more active and dexterous; but no distinction in general efficiency among the Comstock Lode miners can be based on national differences. No poor workmen are employed, and the only ground of preference is the superior skill and intelligence of an individual applicant, whether he be a Swede, Italian, Englishman, or American.

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[1] Pay-roll of Consolidated Virginia Mining Company, January, 1881.

[2] James G. Fair and other superintendents of principal mines.

A clear presentation of the comparative numbers, height, and weight of the Comstock miners is given in the table appended, showing the actual working force in 1880:

Table showing nationality, age, height, and weight of men on Comstock Lode and in Sutro Tunnel.

NATIONALITY.	Total number.	Married.	Single.	AGE.			
				Aggregate years.	Average.	Maximum.	Minimum.
Americans	770	360	410	27,627	35.83	65	17
Australians	1			47	47	27	27
Austrians	11	3	8	378	34.36	54	20
Belgians	2	2		66	33	33	33
Canadians	191	71	120	6,612	34.82	53	18
Chinese	1		1	48	48	48	48
Danes	16	7	9	636	39.67	58	24
English	640	357	283	23,108	36.30	59	19
Finlanders	1		1	35	35	35	35
French	17	7	10	660	39.35	50	25
Germans	55	27	28	2,171	39.28	58	24
Dutch	2	2		104	52	56	48
Irish	816	434	382	30,510	37.26	65	17
Italians	14	3	11	490	35	60	22
Laplanders	1	1		52	52	52	52
Manxmen	3		3	115	38.33	46	32
New Brunswickers	5	3	2	187	37	51	20
Norwegians	6	3	3	213	35.55	46	27
Nova Scotians	32	16	16	1,137	35.53	50	21
Portuguese	19	12	7	678	36.73	50	28
Prince Edward Islanders	1		1	41	41	41	41
Prussians	12	8	4	528	44	55	32
Russians	2	2		94	47	59	35
Scotch	83	37	46	3,120	37.59	57	24
Slavonians	1		1	38	38	38	38
Swedes	22	9	13	859	39.04	51	27
Swiss	12	7	5	419	34.91	50	25
Welsh	34	16	18	1,394	39.82	56	23
TOTAL	2,770	1,388	1,382	101,369	36.67	65	17

Table showing nationality, age, &c.—Continued.

Nationality.	Height.								Weight.			
	Aggregate.		Average.		Maximum.		Minimum.		Aggregate.	Average.	Maximum.	Minimum.
	ft.	*in.*	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*
Americans	4,426	9½	5	8.98	6	3½	5	1	125,647	162.96	235	115
Australians	5	8½	5	8.50	5	8½	5	8½	196	196	196	196
Austrians	65	2	5	11.10	6	6½	5	6	1,875	170.45	206	135
Belgians	11	10	5	5	6	2	5	8	334	167	195	139
Canadians	1,101	4	5	9.19	6	4	5	4	31,744	166.19	210	128
Chinese	5	8	5	8	5	8	5	8	145	145	145	145
Danes	86	11½	5	7.43	6		5	2½	2,555	153.43	196	120
English	3,615	6½	5	7.80	6	3	5		101,449	158.76	242	120
Finlanders	5	8	5	8	5	8	5	8	150	150	150	150
French	96	11	5	8.41	6	3	5	6	2,807	165.11	196	137
Germans	313		5	8.29	6	2	5	4	9,016	163.90	202	125
Dutch	10	6½	5	3.25	5	6	5	½	297	148.50	157	140
Irish	4,677	9½	5	8.79	6	5½	5	½	133,363	163.43	225	103
Italians	79	10	5	8.50	5	11½	5	6	2,276	162.57	184	140
Laplanders	5	9	5	9	5	9	5	9	150	150	150	150
Manxmen	16	11½	5	9.50	5	9	5	8½	516	172	170	164
New Brunswickers	28	6½	5	8.50	5	10	5	6	805	161	195	140
Norwegians	35	5½	5	10.91	6	1	5	8½	1,010	168.33	196	145
Nova Scotians	186	4	5	9.54	6	3	5	6	5,371	167.84	195	137
Portuguese	107	4½	5	7.81	5	10	5	5	2,999	157.84	188	130
Prince Edward Islanders	6		6		6		6		170	170	170	170
Prussians	68	4	5	8.33	6		5	5	2,011	167.58	225	138
Russians	11	2	5	7	5	8	5	6	312	156	162	150
Scotch	474		5	8.53	6	1	5	4	23,346	160.79	194	125
Slavonians	5	10	5	10	5	10	5	10	149	149	149	149
Swedes	124	10½	5	8.11	6	1	5	4	3,506	159.36	149	149
Swiss	67	2	5	7.16	5	10	5	4	1,899	158.25	176	140
Welsh	193	5½	5	7.92	6		5	3	5,516	162.23	225	136
Total	15,973	11½	5	8.20	6	6½	5		450,614	165.92	242	103

[1] *Table showing the employment of men in the Comstock Lode and in the Sutro Tunnel*, 1880.

NATIONALITY.	EMPLOYMENT.																		
	Blacksmiths.	Blacksmith helpers.	Boilermakers.	Bosses.	Brakemen.	Bricklayers.	Carmen.	Carpenters.	Cook.	Engineers.	Firemen.	Foremen.	Fuse maker.	Harness maker.	Hostler.	Laborers.	Lampmen.	Mechanics.	Machinists.
Americans	17	7	1	12	4	1	10	46		97	41	13	1			40			31
Australians																			
Austrians																			
Belgians																1			
Canadians	5	2	2	7	1		4	12		3	1	3		1		7			3
Chinese									1										
Danes				1				1		1						3			
English	16	2	1	6	1		2	6		16	4	6				4			10
Finlanders																			
French								1								1			1
Germans		1	1	2				2		2	1					9	1		
Dutch								1											
Irish	12	11	1	9		1	1	5		12	11	7			1	26	1		4
Italians																1			1
Laplanders		1																	
Manxmen																			
New Brunswickers	1							1		1						1			
Norwegians								1											
Nova Scotians	5	1						4		1	1	1							
Portuguese											1					5			
Prince Edward Islanders																			
Prussians								1		1						1			
Russians																			
Scotch	3	1		1				6		12	5	1				3		5	
Slavonians																			
Swedes								1		1	1					4			
Swiss																3			1
Welsh	3									3						2			
TOTAL	62	26	6	38	6	2	17	88	1	150	66	31	1	1	1	111	2	5	51

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[1] Records of Special Agents, Tenth Census.

Table showing the employment of men—Continued.

NATIONALITY.	EMPLOYMENT.																			
	Machinist helpers.	Mason.	Melters.	Millwrights.	Miners.	Molders.	Mule drivers.	Oilers.	Painters.	Pipeman.	Porter.	Pumpmen.	Ropemen.	Shipper.	Teamsters.	Tinsmith.	Watchmen.	Woodmen.	Wood-passers.	Wood-sawyers.
Americans	2	1	2	1	394	1	7	2	2			8	2	1	1	1	15	5	3	1
Australians					1															
Austrians					9					1								1		
Belgians					1															
Canadians					132		1				1	1	1		1		2	1		
Chinese																				
Danes					8								2							
English					543			1				15	2				3		1	
Finlanders													1							
French					14															
Germans					30			2					2							2
Dutch					1															
Irish				1	691	1						3	3				9	1	2	3
Italians					11														1	
Laplanders																				
Manxmen					3															
New Brunswickers							1													
Norwegians					5															
Nova Scotians					17								1							1
Portuguese					9								3						1	
Prince Edward Islanders					1															
Prussians					9															
Russians					1								1							
Scotch					44								1					1		
Slavonians					1															
Swedes					11								4							
Swiss					8															
Welsh					22								3				1			
TOTAL	2	1	2	2	1,966	2	9	5	2	1	1	27	26	1	2	1	30	9	8	7

The relative efficiency of these workmen is so great that, notwithstanding the high rate of wages, the cost of extracting ore is not excessive as compared with the same expense in other districts. Thus, in 1877, 217,432 tons of ore were quarried and raised to the surface by the California Mining Company from an average depth of 1,600 feet at a cost of

$6.12+per ton.[1] One hundred and ninety-one thousand five hundred and two days' labor was paid for, showing an average daily extraction throughout the year of $1\frac{13}{100}$ tons of ore for every employé. This record is without parallel, and attests the remarkable efficiency of the miners beyond question, though due allowance should be made for the favorable conditions under which the work was done, the size and character of the ore-body, and the admirable mechanical appliances.

Workmen of such exceptional ability would command unusually high wages if the rate was fixed by open competition, though probably all would not receive the amount actually paid—$4.05¼ per shift of eight hours for every man employed under-ground. Yet, upon a competitive basis, the workmen in the lower levels might earn even more than the standard rate, for during the past year (1880), when the known ore-bodies were nearly exhausted and the supply of labor was largely in excess of the demand, the best miners were paid as much as $4.75 per day.[2] Picked men are needed for service at the great depth attained by the principal mine shafts, and no mine overseer grudges them the pay demanded. It is only proposed that workmen in the upper levels, where the labor is less exhausting, should receive proportionate compensation. A graded scale has been suggested with official sanction, viz:[3]

Wages for 8 hours' work (one shift) in levels between surface and 500-foot level	$2—2.50
Wages for 8 hours' work (one shift) in levels between 500-foot level and 1,650-foot level	3
Wages for 8 hours' work (one shift) in levels between 1,650-foot level and 2,500-foot level	3.50
Wages for 8 hours' work (one shift) in levels below 2,500-foot level	4

This seems as fair a proportionment as can be devised while fixed rates of labor are retained; or if this plan is disliked, a substitute is tendered by which shifts above the 2,400-foot level shall be made a little more than two hours longer than the regular eight hours' shift, the pay of $4 per shift being unchanged.[4] The first offer is the best of the two

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[1] Annual Report California Mining Company, 1878.

Hoisting ore	$186,461 82
Supplies consumed	357,101 67
Salaries and wages	788,012 00
Total	$1,331,575 49

[2] Pay-roll of the Consolidated Virginia Mining Company, January, 1881.

[3] Territorial Enterprise, February 15, 1881.

[4] Territorial Enterprise, February 25, 1881.

for the body of laborers, as the grading is more complete and the discrimination in favor of the most competent applicants will be less marked; yet the union hesitates to accept these terms (February, 1881), though a third of their members are idle and many are suffering from want. They refuse to accept the inevitable and seem to prefer starvation to scaled wages. A considerable amount of low-grade ore is left in the upper mine levels which could be extracted if the cost of labor were reduced; for then the idle could be employed, young and inexperienced workmen could earn a living, sons could assist fathers in the support of families, and all would have food, clothing, and shelter. Beggary and debt would diminish, all branches of business would thrive, and the mining towns might point with pride to their industry and prosperity.

Against these certain benefits is opposed the dislike to abandon an untenable position, absurdly styled a principle, which is a standard conceived in ignorance and grounded on selfishness. All men are not equal in the sense of the miners' union; individual services are unequal, and uniform payment is, therefore, unjust and cannot long be maintained. It is unjust to the best workmen, for "the idea of keeping men at the same rate does not mean bringing the bad to the level of the good, but the good to the level of the bad;"[1] it is unjust to weak and unskilled laborers, for, in times of business depression, they are perforce discharged and must beg or starve; it is unjust to the employer, for it checks competition, discourages individual exertion, fetters progress, diminishes production, reduces the profits of capital, and compels him to pay the same sum for unequal services. Exceptional conditions may bolster up the anomaly for a time, but its ultimate fall is inevitable. Meanwhile, its advocates are acting the part of dogs in the manger, denying work to others which they are unwilling to do themselves. This is a plain statement of facts, though somewhat harsh in sound; but the blind selfishness of the union is not pointed out in an unfriendly spirit.

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[1] *Vide* the admirable statement of Mr. Lucas, who "began life working for six shillings per week," before the Royal Institute of British Architects, February 4, 1878; Brassey's "Labour Question," Appendix, p. 311.

CHAPTER XIX.

PAINS AND PERILS OF MINING.

A false principle is attacked, but not its individual supporters. To abolish the arbitrary standard is now certainly to serve rather than to injure them. Their perilous and exhausting work deserves adequate and duly proportioned compensation. No wages at present given are too high for the service required in the hot levels. The miners of Washoe are not forced to climb wearisome flights of ladders, bearing ore on their heads, like the Mexican tenateros, but they descend daily into rock furnaces compared with which the hottest Mexican mines are cooling stations. View their work! Descending from the surface in the shaft-cages, they enter narrow galleries where the air is scarce respirable. By the dim light of their lanterns a dingy rock surface, braced by rotting props, is visible. The stenches of decaying vegetable matter, hot foul water, and human excretions intensify the effects of the heat. The men throw off their clothes at once. Only a light breech-cloth covers their hips, and thick-soled shoes protect their feet from the scorching rocks and steaming rills of water which trickle over the floor of the levels. Except for these coverings they toil naked, with heavy drops of sweat starting from every pore. If woolen garments are put on they soon cling to the body in hot dripping folds, irritating the flesh and checking the natural evaporation until the blood courses feverishly through the arteries, the veins swell, the skin itches unbearably, and the wearer tears off the irksome clothing as if it were in truth the shirt of Nessus. Yet, though naked, they can only work at some stopes for a few moments at a time, dipping their heads repeatedly under water-showers from conduit pipes, and frequently filling their lungs with fresh air at the open ends of the blower-tubes. Then they are forced to go back to stations where the ventilation is better and gain strength for the renewal of their labor. The cause of the extraordinary increase of heat with progress in depth along the line of the lode is still a matter of controversy.[1] Professor Church and other observers believe that the rising temperature is entirely due to chemical combination between the lode rocks and the water which fills their seams and fissures.[2] This assumption is apparently invalidated by the more complete investigations made by Professor George F. Becker and associate physicists during the past two years. If it is established that no rise in temperature is due to kaolinization of the lode feldspar, its chief cause is doubtless the heat of the springs or water reservoirs in the lode, which rise, perhaps through long and tortuous channels, from depths where the eruptive rocks retain much of their primal heat, or where a process of chemical combination is actually heat-producing. Unfortunately, no exact record of temperature at successive levels, under similar conditions, was made during the period of the lode development since 1860, so that complete data relating to the increase of temperature are lacking.

In the mines of a number of companies in early years the atmosphere in many levels was warmer than has been noted at corresponding depths in the silver mines of other districts and countries. This exceptional temperature was doubtless due in great part to defective ventilation, for some of the mines were opened heedlessly and blunderingly. Adits were cut for hundreds of feet without any ventilating shaft,[3] and men worked with dogged persistence at the end of drifts, breathing an atmosphere so foul that candles flickered and burned with a faint-blue flame. When four or five candles, held at the face of a stope, only gave such light as one would furnish in pure air,[4] it was not surprising that such levels were accounted hot and noisome, though the indicated temperature might not exceed 80°.

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[1] The Comstock Lode. Its Formation and History; by John A. Church, E. M.; pp. 208-220.

[2] This process is kaolinization, the anhydrous aluminic silicate of the feldspathic and amphibolic rocks of the Comstock being changed to clay by combining with water.

[3] Isaac E. James, superintendent of Sierra Nevada Mining Company; Philip Deidesheimer, superintendent of Hale & Norcross Mining Company.

[4] Isaac E. James.

The first recorded instance when an unusual degree of heat was noted, which cannot be attributed mainly to lack of ventilation, was in the 900-foot level of the Belcher Mine, at the close of the year 1866. The shaft had been cut rapidly through the barren strata which extended from the 500-foot level and ventilation was no doubt poor, but when miners could work for a few moments only at a time, and sweat filled their loose shoes "until it ran over the tops,"[1] some other cause must be looked for which could produce a heat like this.

Two years later, when the 1,000-foot level had been reached and passed by the shafts of several mines, the heat had increased to such a degree that it became absolutely necessary to devise some method of lowering the normal temperature. The connection between adjoining shafts was more regularly made, and the drafts or air-currents thus established were utilized as far as possible throughout the levels. Still the heat in some drifts was fast becoming unbearable. Fortunately, the rock strata of the lower levels were dryer than the strata above, so that the hot atmosphere was not charged with vapor; yet when the dry air at the end of drifts and cross-cuts did not circulate freely it soon became unfit to breathe, and the gasping miners were forced to seek fresh-air currents at frequent intervals.

Powerful blowers or revolving fans were then (1868) generally put in use along the line of the lode.[2] In August of this year the lower levels of the Bullion Mine were as "dry as a lime-kiln and as hot as an oven."[3] This mine was the deepest on the lode at the time, its shaft having reached a point 1,200 feet below the surface; but the heat in adjoining mines was nearly as great. In the lower workings of the Chollar-Potosi at a depth of 1,100 feet the thermometer registered 100° Fahr. during the same month,[4] and 110° Fahr. in the lower level of the Hale & Norcross Mine.[5] A very marked reduction of temperature was noted as soon as the blowers were fairly in operation. The thermometer in the lower level of the Hale & Norcross Mine fell from 100° to 90° Fahr. in the course of a few days after their blower (Root patent No. 3) began to force air into the mine through tubing of galvanized iron.[1] In the Chollar-Potosi Mine conduit boxes of red-wood were used instead of iron tubing,[2] but the comparative nonconductivity of the wood did not offset other relative disadvantages.[3] By the aid of these blowers the normal heat of the drift-headings has been materially reduced; yet even ten years ago the atmosphere at certain points could scarcely be made endurable. In the Yellow Jacket Mine, June 11, 1870, though blowers were constantly at work, the temperature of the 900-foot level at points 300 feet distant from the shaft was 97° Fahr., and the miners were working almost stark naked at the breasts. At the shaft, on the same day, the thermometer marked 87° Fahr.[4] As the work of development progressed it was clearly noted that the points of greatest heat in the lode shifted from one section to another, and that there was no uniform increase of temperature at successive levels.[5] Thus a mine which had been the hottest on the lode in 1870 might be the coolest in 1871; for the uncovering of hot-water springs would raise the temperature of a level many degrees in a few hours, while six months later, when the springs were pumped dry, the atmosphere would again become comparatively cool. So, in the 1,400-foot level of the Crown Point Mine, a stream of water gushed from a drill-hole, in June, 1873, so hot that eggs could readily be cooked in it, and work at this point was seriously retarded in consequence;[6] yet before the end of the year, with the slackening of the water-flow, the temperature of the level fell many degrees.

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[1] Gold Hill News, December 29, 1866.

[2] Territorial Enterprise, December 11, 1868.

[3] Territorial Enterprise, August 7, 1868.

[4] *Ibid.*, August 7, 1868.

[5] *Ibid.*, August 20, 1868.

Though the heat did not increase proportionately to the progress in depth, so far as observed, yet as the shafts drew near to the Sutro Tunnel level the atmosphere in nearly all the mines became so hot that the work of exploration along the line of the lode was attended with much suffering. Sometimes, no doubt, extreme suffering was needlessly caused by neglect to establish the necessary air-current, as in the 1,850-foot level of the Bullion Mine, when a drift opened from the Imperial shaft attained a length of 1,700 feet before any attempt was made to secure proper ventilation. The thermometer at the end of the drift registered a temperature ranging from 130° to 140° Fahr., and work was naturally most painful and costly; but when connection was made with an adjoining shaft the thermometer fell rapidly from 138° to 100 Fahr.[1] Such heedlessness was, however, uncommon; the great air-currents which passed down the shafts were generally well utilized. How abundant a supply was thus furnished in 1877 has been carefully calculated. The velocity of the air rising from eleven different shafts ranged from 200 to 900 feet per minute, and the average velocity was 400 feet per minute; 288,630 cubic feet of air were issuing momently from the shafts, and as two upcast currents were inaccessible, it was safe to estimate the total outflow at 300,000 cubic feet, or 11¼ tons, per minute. The natural influx of air supplied most of this efflux; but it was computed that 10,000 cubic feet were forced in by air-compressors and 30,000 cubic feet by blowers.[2] By the issuing air-currents and by the water drawn from the mines through the pumps it was computed the rocks were losing as much heat yearly as 28,601 tons of carbon would yield; or, in other words, the ordinary operations of mining were abstracting yearly from the rocks as much heat as 55,472 tons of anthracite produce in the best manufacturing usage.[3]

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[1] Territorial Enterprise, August 7, 20, 1868.

[2] *Ibid*, August 19, 1868.

[3] The diameter of the iron pipes ranges from 8 to 20 inches, but the size found to be most serviceable is 11 inches in diameter. About 700 cubic feet of air are blown through a pipe per minute, furnishing a supply for from two to six men at the face of a heading. The air passes through the pipe with a velocity of 1,000 feet per minute and returns through the drift at a rate of from 35 to 40 feet per minute. Its temperature at the mouth of the pipe ranges commonly from 85° to 90° Fahr.—"The Comstock Lode," p. 188; John A. Church, E. M.

[4] Gold Hill News, June 13, 1870.

[5] *Vide*, in this connection, "The Comstock Lode," p. 184; John A. Church, E. M.

[6] Territorial Enterprise, July 27, 1873.

Yet, in spite of this extraordinary abstraction of heat and the inpouring volumes of fresh air, the atmosphere of the lower levels was most oppressive.[4] Tons of ice were sent down daily into the mines;[5] the half-fainting men chewed fragments greedily to cool their parched throats, and carried lumps in their clinched hands through the drifts; iced water from the tanks was drank in extraordinary quantities. In the hotter levels three gallons was a moderate allowance for one man during a shift of 8 hours;[1] and 95 pounds of ice was the average daily consumption of every miner employed in the hottest workings of the California and Consolidated Virginia mines during the summer of 1878.[2] If power-drills had not been in general use the work of exploration would probably have come to a close. To penetrate hard rock while breathing such an atmosphere would have taxed human endurance too greatly; even to cut out the decomposed feldspar with light steel picks was a painful labor. At some stopes in the great ore-body of the California and Consolidated Virginia mines four miners could scarcely do the ordinary work of one man in a moderately cool drift;[3] yet no mines were more carefully ventilated than these. When the incline from the Savage Mine shaft uncovered a hot spring, in July, 1877, ordinary miners would have refused to press the work farther. The temperature of the water as it issued from the rock was 157° Fahr., and the incline was filled with almost scalding vapor; picks could only be handled with gloves, and rags soaked in ice-water were wrapped about the iron drills.[4] Men could only stand for a few minutes at a time near the hot fountain, and the work was carried on by successive relays. At the head of the incline, where it was necessary to attach a V-bob to the pump-rod, the atmosphere was oppressive to the last degree of endurance. The station was only comparable, wrote a careful observer, to the hottest of the vapor-baths at Steamboat Springs.[5] Here the men employed could not leave their work as often as the miners who guided the drills, but were forced to breathe this suffocating vapor till they often staggered forth from the station half blinded and bent by agonizing cramps. When the pain was so great that men began to rave or talk incoherently their companions would quickly take them up and carry them to the coolest place on the level, where they were subjected to a vigorous rubbing on all parts of the body, but particularly on the pit of the stomach. When the so-called "stomach-knots" disappeared under the friendly hands the checked perspiration again began to flow, and the men regained their senses.[1] Sometimes, however, the effects were more lasting, as when Thomas Brown, a miner at work on the 1,900-foot level of the Gould & Curry Mine (May 10, 1878), fainted and fell on the track floor, having been breathing for some time an atmosphere whose temperature was 128° Fahr. He was carried at once to the surface, but continued in a dazed condition for some time, having lost his memory, and babbling like a young child.[2]

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[1] "The Comstock Lode," p. 19; John A. Church, E. M.

[2] *Ibid.*, p. 18.

[3] *Ibid.*, p. 159.

[4] Territorial Enterprise, August 4, 1877.

[5] *Ibid.*, October 26, 1877.

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[1] "The Comstock Lode," John A. Church, E. M.

[2] Territorial Enterprise, July 27, 1878.

[3] *Ibid.*

[4] *Ibid.*, October 26, 1877.

[5] *Ibid.*, February 2, 1878.

It may easily be understood that work could rarely be carried on at a profit when men were exposed to a heat like this. Thus, even in the case of the great Consolidated Virginia bonanza, an ore-body of exceptional richness, it was judged expedient to discharge a large part of the working force until the temperature of the lower levels could be reduced to a bearable degree by extended drift connections and the consequent injection of cool surface-air from the blower-tubes.[3] On the 1,600 and 1,700-foot levels the heat of the atmosphere, even at the stations, was 104° Fahr. in November, 1878,[4] and on the 1,750 and 1,850-foot levels it was 108° Fahr.[5] Such heat, though oppressive, might appear endurable, but often the record of temperature gives only a faint idea of the real condition of the atmosphere. A degree of heat which could be borne without discomfort in a Russian bath-house of modern design, where the air is pure and no draughts are felt, would be extremely painful in the galleries of a mine. Sometimes hot vapor fills the drifts charged with nauseous exhalations from the springs and rotting timbers. Even when the air is dry the breath of the miners soon vitiates it in most working stations, and the lungs are constantly oppressed from lack of oxygen. In this atmosphere men soon grow faint, even when puffs of fresh air from the mouths of blower-tubes are blown about their heads unremittingly. Hot draughts are more annoying than a still atmosphere of equal temperature, for when hot foul air is in rapid motion it is scarcely respirable.[1] When it is considered, moreover, that no exertion is required in a Russian bath, while in the mines the labor is most fatiguing, the difference in the conditions will be apparent. If then the heat actually equals or exceeds the temperature of the hottest bath, as it did in some drifts, the sufferings of the miners may be imagined. In cutting a drift along the west wall of the lode on the 2,000-foot level of the Imperial Mine the miners were only able to advance by boarding the sides of the drift with a double layer of planks, carefully breaking joints and calking the inner seams with tow, for the water which streamed from the rocks was so hot that a jet of scalding vapor would enter the drift whenever a strip of tow was pulled from a seam in the lagging.[2] The heat of the air confined between the planks and the rock was not noted, but within a similar bulkhead in the Crown Point Mine, 2,000 feet from the surface, the temperature was 150° Fahr., and only 16 degrees less in the open drift. Work on the 1,900-foot level of the Ophir Mine, in 1878, was almost equally trying to the miners,[3] and it was scarcely possible to cut the east drift on the 2,200-foot level of the Yellow Jacket Mine in 1879, in order to make a connection with the new shaft, for the thermometer registered 134° Fahr. at the face of the heading;[4] and one might say with truth, as of another mine gallery, that the drift was a place for salamanders rather than men.[5]

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[1] Territorial Enterprise, July 27, 1878.

[2] *Ibid.*, May 11, 1878.

[3] *Ibid.*, November 13, 14, 15, 1878.

[4] *Ibid.*, November 14, 1878.

[5] *Ibid.*, November 15, 1878.

Up to the end of 1877 the highest recorded water temperature was 154° Fahr., and large sections of the lode rock at the 2,000-foot level had a nearly uniform temperature of 130°.[6] The highest water temperature previously noted in other mines was 125° Fahr., at the Huel Clifford, in Cornwall, by J. A. Phillips. During the past three years an increase in water temperature to 170 degrees Fahr. has been recorded,[7] and it may safely be said that the Comstock mines are the hottest by far in the world.[1] Yet for the sake of high wages and the information which gamblers prize, men were willing to suffer this heat and continue the search for ore. Their service demonstrates anew how elastic are the limits of human endurance when men are drawn on by some masterful passion. The bounds of possibility then confine their achievements, but not their attempts. Lured by a golden cup the diver, Nicolas, casts himself headlong into the whirlpool of Charybdis; tempted by the silver of the Comstock mines, men will explore their depths until they drop dead at the stopes. Death alone has the power to say to miners: "Thus far shall ye go and no farther!" for no endurable suffering will bar their progress; nor will the loss of life even make them pause, unless the scourge of heat shall strike them down like a pestilence. Of late years heat has killed strong men in almost every deep mine on the lode, and in some mines the deaths so caused have been frequent. Thus, in November, 1876, a young Irishman

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[1] Records of miners' testimony made by agents of U. S. Census, 1880.

[2] "The Comstock Lode," p. 183; John A. Church, E. M.

[3] Territorial Enterprise, February 2, 3, 1878.

[4] *Ibid.*, February 8, 1879.

[5] *Ibid.*, February 2, 1878.

[6] The Comstock Lode, p. 188; John A. Church, E. M. *Vide* also table of temperatures—air, water, and rock; The Comstock Lode, pp. 179–182.

[7] At the bottom of the Yellow Jacket shaft; Geo. F. Becker, U. S. Geological Survey.

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[1] The most exact determination of the temperature of the rock of the Comstock mining district to the depth of 2,100 feet was made during the period from September, 1878, to August, 1881, at the Combination shaft of the Overman, Caledonia, Belcher, Crown Point, and Segregated Belcher Mining Companies (The Forman shaft). The temperatures were ascertained by drilling holes not less than three feet deep into the rock and inserting a Negretti and Zambra slow-acting thermometer. The holes were then closed with clay, and the thermometer allowed to remain in contact with the rock for twelve hours. Three holes were tried at every level.

DEPTH.	TEMPERATURE.	DEPTH.	TEMPERATURE.
Feet.	°	*Feet.*	°
100	50⅕	1,200	89⅕
200	55	1,300	91⅕
300	62	1,400	96⅕
400	60	1,500	101
500	68	1,600	103
600	71⅕	1,700	104⅕
700	74⅖	1,800	105⅕
800	76⅕	1,900	106
900	78	2,000	111
1,000	81⅕	2,100	119⅕
1,100	84		

It will be seen that although there is upon the whole an increase of temperature as depth is attained, yet the rate of increase is not uniform. As the temperature at different sections of the lode varies also considerably, and as the Forman shaft is sunk in the country rock several hundred yards to the east of the lode croppings, the experiments cannot be considered as furnishing a complete or satisfactory record of lode temperatures with progress in depth.

was taken up dead in the incline of the Imperial Mine at the 1,700-foot level,[1] and only a month later another lifeless body was found in the same level, where the heat was 115° Fahr.[2] Yet even repeated warnings are not heeded, and often men will not realize their danger till their lives are sacrificed; for a novice to work persistently in such an atmosphere was almost surely fatal. So when Thomas Wilson turned a deaf ear to his companions on the 2,000-foot level of the same rock furnace, who urged him to go to the cooling station, no one was surprised to see him drop his pick and fall dead at his post, March 2, 1877.[3] Three deaths from heat within a hundred days is a significant record, but the places of the dead miners were filled before their bodies were buried. Even this record of mortality was surpassed during the following year, when three men were asphyxiated by heat and foul air while climbing up a winze from the 1,900–1,700-foot level in the Gould and Curry Mine. A thermometer indicated that the temperature at the point where they died was 135° Fahr.[4]

To lie gasping, with swollen veins and purple face, on a hot rock floor until the dull eyes are glazed in death is a dreadful fate, but not so agonizing as another mode of torturing by heat in the mines of the lode. The hot water which spouted from the rocks stood in deep pools at the bottom of inclines or the foot of shafts. A misstep or slip would sometimes cause men to fall into these deadly baths, from which they crawled or were dragged only to linger a few hours in hopeless misery. So John Exley died in April, 1877, having fallen into the sump of the Hale & Norcross Mine incline, then a little below the 1,900-foot level. Though the water only covered his hips, and he was immediately plucked out, the skin fell off his limbs from his knees down, and unremitting care could not save his life.[5] Eight months later Michael Comerford rolled into the sump of the same incline, then one hundred feet deeper, and perished miserably after one despairing effort to pull himself out by clutching at the clay-besmeared timbers above his head. Marks of his fingers in the slime were seen by the party in search of the missing man, and the ghastly, flesh-cracked corpse was dragged up from the bottom of the incline with a pole and hook. The heat of the water in this sump was then 157° Fahr.[1] To drag a man alive from such a pool was a cruel service, as was afterwards noted when William Jenkins was taken from the sump of the Julia Mine shaft, February 5, 1879. Though immersed only a few seconds in the water, whose temperature was 158° Fahr., he was literally flayed alive and cried for death, though his sufferings were somewhat relieved by injections of morphine.[2]

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[1] Territorial Enterprise, December 2, 1876.

[2] *Ibid.*, December 27, 1876.

[3] *Ibid.*, March 3, 1877.

[4] *Ibid.*, June 4, 1878.

[5] *Ibid.*, April 17, 1877.

Even if men escaped the dangers of scalding and suffocation, they were exposed to another peril arising from the heat. The miners in the hot levels were subjected to most trying changes of temperature in ascending the shafts on the swift-moving cages. The passage of two thousand feet in winter was like a magical transfer from Guiana to Spitzbergen. In three minutes men who had been sweltering naked in a stifling atmosphere might be lifted up into the chill air of bleak hills where a snowstorm was raging. As an elastic bow, if bent too suddenly, may break, so a strong man, who can endure great heat or cold, may succumb to the shock of a quick alternation from one extreme to the other. Hence it was that men who stood shivering on the iron bars of the cage floor often felt a sudden nausea and dizziness as they were borne up the shaft. Then, if their companions did not support them with ready and strong arms, the fainting men would lose their firm grip of the bar and sink helplessly against the timbers of the shaft, to be instantly crushed by the iron sides of the cage and fall mangled to the sump. Such a fate was horrible to witness, yet so great was the speed of the cages that the victims must have died with scarcely an instant's pang, and even that agony was dulled by the existing stupor. Thus the death of a young Nova Scotian miner in the shaft of the Consolidated Imperial Mine, December 12, 1876, was less painful probably than the deaths of the three miners who perished during the same fatal period of intense heat before noted, though his head, legs, and arms were torn off, and the shapeless remains of a body which had been a model of manly vigor were brought to the surface in a blanket.[1]

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[1] Territorial Enterprise, December 23, 1877.

[2] *Ibid.*, February 7, 1879.

Men who will face such suffering and peril daily are men of no ordinary hardihood. Custom, it is true, has inured them to their surroundings. When men first begin work in hot mines they lose their strength almost invariably, and the slightest exertion is burdensome. They feel no desire to eat, and the stomach commonly rejects whatever food is taken. Ordinarily, also, the decrease in their weight is very considerable. This condition of body does not last more than three or four days usually. Then the men regain their vigor and flesh rapidly; their appetite returns and their health does not visibly suffer. In many instances the effect of the heat is clearly beneficial. By the exercise of care in avoiding sudden chills rheumatic affections are eradicated; all impurities of the blood are rapidly purged from the system; boils, pimples, and other skin eruptions soon disappear; the flesh becomes plump and firm; the glands secrete oil rapidly; the skin grows smooth and slippery to the touch, and the complexion is clear, if somewhat sallow.[2]

The ultimate effect of this extreme heat on the miner's constitution is not so easily noted. The mine levels differ so materially in temperature, and the assigned station of a miner is so frequently changed from one cause and another, that it is impossible to obtain at present complete comparative data. That prolonged labor in a hot, impure atmosphere will assuredly shorten life appears indisputable; but whether the system is permanently or materially injured by intermittent work under these conditions is more questionable. The power of recuperation appears extraordinary, and, unless the strain is intense and frequent, no lasting injury may be inflicted.[3] The limits of permissible strains will, of course, vary with the relative power of endurance.

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[1] Territorial Enterprise, December 13, 1876.

[2] Record of testimony procured by United States Census Agents, 1880.

[3] Records and testimony as to the injury to health resulting from labor in the hot levels of the Comstock mines differ materially from the conclusions reached by Dr. Paul Fabre, from his study of the diseases of miners. Article in Popular Science Monthly, March, 1881.

The action of all the bodily organs appears to be stimulated by the heat, with the exception of the stomach alone. The food of the ordinary laborer is unpalatable to the miner in the hot levels, and coarse, ill-cooked provisions would not be accepted or digested readily. The men crave fruits and highly-seasoned dishes, pickles, salads, pig's feet, hams—almost any food with a pure acid or salt flavor. They demand and obtain the best supplies in the market to gratify their natural craving and squeamishness of taste.[1] The delicate condition of their digestive powers is, undoubtedly, due to the quantity of iced-water which they drink as much as to the heat which they undergo. Yet they must have cool drinks at frequent intervals, and feverish men cannot be expected to gauge carefully the quantity or the coldness of the water which they need. If the temperature of the water-tanks was regulated by the mine superintendents their employés would be less subject to dyspepsia.

Aside from the perils arising from the exceptional heat of the Comstock Lode, it would appear also that the ordinary dangers of deep mining exist there in aggravated forms. The gangue of the lode is decomposed feldspar—a conglomerate of brittle quartz and swelling clay; hence the walls and roof of the galleries need firm buttresses of timber, and nowhere can the crumbling rock be trusted to its own cohesion without a prop. The clay seams on exposure to air swell and separate in heavy flakes from the walls. The rotten quartz cracks under the pressure from above until the trembling roof gapes open suddenly and the passage is choked by masses of fallen rock. If men are working in the drift when the walls cave in they rarely escape with life, and the roll of deaths from this cause in the Comstock mines is unusually large. This disproportionate mortality has not arisen from any negligence on the part of the superintendents since the early years of the development of the lode; nor was it attributable at any time to a wretched parsimony which restricted the use of mine-timbers, but rather to the treacherous nature of the gangue and the recklessness of miners, who sometimes disregard orders and necessary precautions.

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[1] Record of testimony procured by United States Census Agents, 1880.

The very perfection of the present machinery for raising and lowering the cages into the shafts has been a prolific source of danger to life. Such high speed is attained by the engines that a moment of heedlessness or indecision has often proved fatal. One careless motion of a miner in passing through the shaft may sever a leg, an arm, a head, or hurl his bleeding body from timber to timber till it drops shapeless and crushed into the hot pool at the bottom. The accumulated momentum of a body in falling from an upper level to the foot of a deep shaft is sufficient to reduce the bones to pulp if any hard substance is struck in its descent. In July, 1867, a miner weighing 180 pounds fell down the Crown Point Mine shaft, a distance of 410 feet, breaking a plank three inches in thickness as if it were a pipe-stem. The men at the lower station, where the plank extended across the shaft, could not see what substance snapped the timber.[1] Even an iron barrier will be broken through by such a blow, as was shown in December, 1873, when a man dropped down the shaft of the Consolidated Virginia Mine upon a cage filled with miners, 1,200 feet below the initial point of his fall. The strong iron covering or bonnet of the cage was bent and broken, and the body of the unfortunate miner was literally crushed into pulp.[2] Or if an engineer fails to watch the gliding cable with keen eye, the cage may pass its destined station and plunge into the sump or be drawn violently against the sheave-frame in the hoisting works. Thus John Sinnott was crushed between a cage and the bottom of the Savage Mine shaft in November, 1869, so that his ankle bone was driven through the stout india-rubber boot which he wore.[3] And, to cite one of a number of instances, the fatal accident at the Union shaft, in December, 1879, shows how even a careful and strictly temperate engineer may lose his presence of mind and allow a cage full of men to be drawn into the sheave.

The engineer was hoisting a cage and skip on which were seventeen men from the bottom of the shaft. As the load neared the surface he pulled the lever of his engine, intending to shut off the steam, but, strangely enough, gave a wrong turn to the lever, and the cage shot upward with a sudden bound under the increased pressure. In the effort to rectify his mistake he blundered again in the same way, and in a moment the cage was torn out of the shaft as if shot from a catapult. Streams of fire flashed from the guides as the cage went up, and a bluish light appeared on its iron frame. The doomed men on the cage uttered no cry. One said simply, "Boys, we're gone!" just before the cage struck the gallows frame with a frightful shock. The steel-wire cable, seven inches in width and three-quarters of an inch in thickness, was snapped like twine, parting with a report "like that of a cannon." The whole building was shaken to its foundations, and some within started to run out, thinking that a boiler had exploded. The iron bonnet of the cage was crushed flat by the concussion, and the men on the cage and skip were thrown sprawling over the floor of the shaft-house. Most lay senseless for a time, but soon one after another began to raise themselves upon their hands and knees with pititul groans. Help was quickly given and the suffering men were removed, but the floor was still a ghastly sight with its stains and little pools of blood. Two miners died of their wounds before the day was ended, and six others, at least, were permanently injured. Two who clung to the shattered cage, and one who caught the bell-rope by a desperate leap, were marvelously fortunate in escaping unhurt.[1]

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[1] Sacramento Union, July 18, 1867.

[2] Gold Hill News, November 15, 1873.

[3] *Ibid.*, November 8, 1869.

To describe in detail the manifold ways in which men have lost their lives in these mines would be a needless catalogue of horrors. How dynamite and powder have exploded prematurely or tardily, striking down men under a hail of rock fragments; how cables have broken and cages fallen in the shafts; how miners have been crushed by falling timbers and buried under masses of quartz—these and other like accompaniments of mine development present no distinctive features and are most fitly recorded in a general summary.

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[1] Territorial Enterprise, December 3, 1879.

Table of accidents in Comstock Lode mines from October 16, 1863, *to June* 19. 1880.[a]

YEAR.	FATAL ACCIDENTS.													
	Caving, fall of roof, &c.	Premature explosion of powder.	Falling of cages.	Overwinding.	Falls unconnected with hoisting machinery.	Falling of tools, timber, rock, &c.	Crushed by cage in motion.	Breaking of machinery in shaft-works.	Mine fires.	Heat or foul air.	Scalding by mine-water.	Accidents connected with hoisting machinery.	Unclassified.	TOTAL.
1863			1		3							1		6
1864	1	1	3		8	1						1		15
1865	2				5	1								8
1866	1		1		6	2								10
1867	1				6	1						3		11
1868					4	1								5
1869					6		1	1	37			4		49
1870	2					1	1	2						7
1871				1	2	2	3					3		11
1872	1	1			5	1		1						12
1873	1				6	1			6					14
1874					4	1	2	3	3			1		18
1875	1	2			12		3					1		20
1876	2	1			10	2	4	2		1	1	2		25
1877	2	4			5	2	4			1	1	2		22
1878	4	4			6		1	3		6		2		26
1879		6			6	3	2		3	1	2	3		26
1880					1	7	1	1						10
TOTAL.	18	19	5	1	95	26	22	13	49	9	4	23	11	295
	ACCIDENTS NOT REPORTED AS FATAL.													
1863												1		1
1864	1	1	2		4	3						5		17
1865	4	1			7	4						8		25
1866	2				1	8						5		15
1867	7	2			6	5						2		22
1868	7	1	5		8	6	2					9		28
1869	1	1			6	2	4					1		15
1870	5	1			6	4	4							20
1871	6	3			8	8	5					1		33
1872	4	3			3	12	4					3		35
1873	6	2	1		5	10	4			3		3		35
1874	8	7			12	8	9	6	7			4		61
1875	3	4			9	21	9	2				11		65
1876	4	4			5	10	6	1				7		47
1877	7	11			6	3	1			1		9		50
1878	2	5			14	13	8	5				9		60
1879	5	3			8	2	21			5	1	7		53
1880	3	1			2	3		2				1		14
TOTAL.	75	50	8		110	120	77	16	7	9	1	86	47	606

[a] Record compiled from files of newspapers published at the mines, and doubtless incomplete, but best now attainable.

The most noticeable effect of the exceptionably high rate of mortality in the Comstock mines is the recklessness of temper and disposition toward fatalism which is thereby engendered among the miners. When a man is accustomed to incur many and imminent risks of death daily, he comes at length, by force of habit, to regard them lightly, or he fosters a stolidity of temperament as his best safeguard against nervous apprehensions. If the fear of death was constantly before his eyes he would be unfit for work, and he knows that coolness is a sure staff in time of danger; hence he turns his mind, as far as possible, from thoughts of probable peril, and yet is prepared to act promptly and energetically when the need arises. If he can do nothing to save his life he meets his death with silent fortitude, as did the company of seventeen who were dashed against the sheave at the Union shaft. He expects to die "when his time comes," but sees no advantage in dying a hundred deaths from fear before. Though few of the miners are professedly without faith in the existence of a God and a future life, it is rare that one prepares himself for death, in the Christian sense, by prayer and self-commitment to a supreme and loving Providence. If a man does his work honestly and well, he considers that in so doing his duty on earth is discharged. He loves life, but does not dread death except as an end to the only life of which he has knowledge. Their fondness for gambling leads them also to regard the possibility of death with instilled *sang froid*, as a risk which every gamester must face, and they stake their lives on the cast because they consider the chances in favor of their preservation. Hence, if by an extraordinary allotment of fortune one plucks his life out of the very jaws of death, as it were, he is not particularly elated or disposed to thanksgiving, but regards the gain much as the inveterate gambler does his winnings. A notable case in point is that of the Cornish miner who fell into the mouth of the Imperial Mine shaft, October 30, 1876. The shaft was 1,300 feet deep, and those who saw him fall believed that he would be a frightfully mangled corpse in a moment. By an astonishing combination of coolness, strength, and luck he caught hold of the pump-bob nose, twenty feet below, and clung to it, dangling over the abyss until rescued. When his companions had lifted him out of the shaft he remarked, coolly, glancing down into the black depths of the great pit: "By the bloody 'ell! if I hadn't caught hold of the bob I'd 'a been scattered all abroad!"[1] Another man might have shuddered, possibly, at this deadly peril, and murmured something like a prayer of thanks for his preservation, but the temper shown by this miner is an extreme illustration of the ordinary mode of thought among the men of his class.

Some are notably religious in disposition and attend regularly at the various churches of the district, but the great majority are not troubled about the state of their souls or heavenly concerns. The clergy of the towns on the lode find the hearts of the miners somewhat thorny ground apparently, though, no doubt, much seed that is choked, to all outward seeming, may yet blossom and bear fruit. It is worth noting that the clergy who complain least of the apathy of the miners are Catholic priests, who take pains to come nearer to their parishioners than the Protestant ministers are able or willing to do. Hardened hearts have never yet been melted by scolding or complaining, and the idea of saving souls by such ministration is absurd. The shrewder Catholic missionaries see this clearly, and devote themselves far more artfully to win the ears and hearts of the people; for they pass through the towns with frank, friendly greetings for all, entering the homes of the miners—not intrusively, nor by formal "pastoral calls," but as friends and counsellors—ready to play a social game of cards on occasion, or to comfort those who are afflicted by sickness or misfortune. Bigoted Puritans may snarl at some of the indulgent ways of their rivals, and comment bitterly on the results of such proselytizing, but it is certainly a close imitation of the method of St. Paul, and has so far proved the only effective means of utilizing a church organization in mining towns. When the Protestant denominations realize this and send men to mining camps who are not wedded to formulas, or creeds, or set plans of worship, but who are content to go about doing good in the ways naturally suggested to sensible, practical Christians, then the observer will not note as now the predominant and growing power of the Church of Rome, the relative feebleness of the Protestant sects, and the despondency of their ministers—for the Catholic ritual is too full of forms and ceremonies to suit the simple, rational notions of the miners, and they require no hierarchical orders, nor intercessors with God, nor any part of the cumbrous system of mediation; but they will welcome any man who comes among them as a brother to joy with their joys, grieve with their griefs, and to assure them that there is a God who cares for them like as a father pitieth his children. One such pastor, who knows the nature and the needs of workingmen, would do more good than a hundred of the dyspeptic and narrow-minded divinity-school graduates, of whom too many are at present floundering about wretchedly in the uncongenial currents of mining-camp life.

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[1] Territorial Enterprise, October 31, 1876; Superintendent of Julia and Ward Mines, 1880.

CHAPTER XX.

A SIGNIFICANT CONTRAST.

The fortunes of the Comstock mining district are now (1881) depressed. Since the discovery of the great Consolidated Virginia (California bonanza in 1873–4) no new ore-body has been developed. An over-sanguine hope of such a discovery did indeed puff up the shares of the Sierra Nevada Mine from $2.90 on May 14, 1878, to $270 four months later,[1]—103,645 shares, or more than the entire stock of the mine (100,000 shares), being sold at one exchange in San Francisco during the month of August.[2] But the boom culminated during the following month, and in spite of the zeal of the bulls the price of the stock dropped irresistibly in November (1878) from $200 to $39. On the 2d day of February, 1881, the value set upon the whole lode and its costly mine works in the stock exchanges was only $7,000,000,[3] which may be fairly contrasted with the valuation (highest) in January, 1875.

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[1] **San Francisco Evening Bulletin, November 6, 1878.**

[2] **Commercial Herald (Stock Report Tables), January 30, 1879.**

[3] ***Vide* Territorial Enterprise, February 3, 1881.**

Valuation of Comstock Mines, February, 1881.

MINES.	SHARES IN MINE.	PRICE PER SHARE.	TOTAL.
Utah	20,000	$5 50	$110,000
Sierra Nevada	100,000	5 00	500,000
Union Consolidated	100,000	8 50	850,000
Mexican	100,800	5 12	516,600
Ophir	100,800	5 00	504,000
California	540,000	1 25	675,000
Consolidated Virginia	540,000	1 90	1,026,000
Best & Belcher	100,800	6 75	680,400
Gould & Curry	108,000	2 50	270,000
Savage	112,000	80	89,600
Hale & Norcross	112,000	2 90	324,800
Chollar	112,000	1 55	173,600
Potosi	112,000	1 75	196,000
Bullion	100,000	1 65	165,000
Exchequer	100,000	1 10	110,000
Alpha	30,000	2 90	87,000
Consolidated Imperial	500,000	05	25,000
Challenge	50,000	50	25,000
Confidence	24,960	2 25	56,160
Yellow Jacket	120,000	1 55	186,000
Kentuck	30,000	1 25	37,500
Crown Point	100,000	1 00	100,000
Belcher	104,000	80	83,200
Segregated Belcher	6,400	4 00	25,600
Overman	115,200	60	69,120
Caledonia	100,000	20	20,000
Total value	....	....	6,905,580

Valuation of Comstock Mines, January, 1875.[1]

Mines.	Number of feet in mine.	Number of shares in mine.	Price per share.	Total.
Utah	1,000	20,000	$11 50	$230,000
Sierra Nevada	3,300	100,000	27 00	2,700,000
Union Consolidated	800	20,000	95 00	1,900,000
Mexican	600	108,000	85 00	9,180,000
Ophir	675	100,800	315 00	31,752,000
California	600	108,000	780 00	84,240,000
Consolidated Virginia	710	108,000	700 00	75,600,000
Best & Belcher	540	100,800	89 00	8,971,200
Gould & Curry	612	48,000	75 00	3,600,000
Savage	771	16,000	190 00	3,040,000
Hale & Norcross	400	16,000	77 00	1,232,000
Chollar-Potosi	1,400	28,000	94 00	2,632,000
Bullion	943	100,000	60 00	6,000,000
Exchequer	400	8,000	425 00	3,400,000
Alpha	306	30,000	45 00	1,350,000
Imperial	184	100,000	23 50	2,350,000
Empire	75	50,000	18 00	900,000
Eclipse	70	25,000	14 50	362,500
French	20	5,000	16 00	80,000
Bacon M. & M. Co.	65	4,000	10 00	40,000
Bowers	20	5,000	Estimated.	15,000
(Unnamed section)	34	....	do.	25,000
Challenge	90	50,000	16 00	80,000
Confidence	130	24,960	59 00	1,472,640
Yellow Jacket	957	24,000	170 00	4,080,000
Kentuck	95	30,000	37 00	1,110,000
Crown Point	541	100,000	47 50	4,750,000
Belcher	1,040	104,000	57 50	5,980,000
Segregated Belcher	160	6,400	165 00	1,056,000
Overman	1,200	38,400	99 00	3,801,600
Caledonia	2,188	20,000	37 00	740,000
Total value	....	....	....	$262,669,940

The pride of the cities on the line of the lode is broken. The prodigal ideas of their founders have been succeeded by careful calculations of current expenses. A civic organization was believed to be more cumbrous and costly than serviceable, and for this reason the city government of Virginia ceased to exist on the 2d of May, 1881, and its powers were transferred to the board of county commissioners.[1] This change is not likely to affect the future development of the mines in any way unfavorably. Whether ore-bodies whose existence is now unknown will be discovered in the depths yet unsearched is, of course, uncertain. The great fissure, filled with quartz, clay, and barren country rock, is still well defined, and the whole lode is impregnated with precious metals, but no bonanzas or concentrations of metalliferous deposits have rewarded the persistent search. No valid argument against their occurrence has been presented, but positive evidence of their existence is lacking.

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[1] *Vide* Table V, Appendix.

Prospecting in barren mines is essentially a gambling venture. Faith, capital, and skill are necessary to prosecute the work to advantage, and the requisites are not lacking. The body of small investors have ceased, it is true, to contribute liberally, and the burden of assessments no longer rests on the petty shareholders, but has been shifted upon the shoulders of the principal mine owners. Yet their shoulders are broad enough to carry the load, and so far they have not faltered under its weight. It is fitting, assuredly, that the men who have made fortunes in the mines should be the last to abandon them. It is fair that they should undertake to sustain the loss during periods of depression, but the people of the district would have no just cause for complaint if the search for ore should be discontinued and the mines finally closed. No obligation rests on any man to expend his wealth in what he may judge to be a fruitless quest, and no one can fairly be expected to incur risks when the returns in view are wholly disproportionate. The time may come when even such daring speculators as Mackey and Fair must count the cost of their ventures carefully and decide to try fortune no more. How many million dollars they are ready to pay out before this termination is reached they alone know, and probably even they themselves cannot fix at present any definite sum. Beyond question their decision will be governed by developments and indications yet unknown. Only one thing is certain—that they will not readily desert a field where they have gained fortunes unprecedented in the history of mining and staked fortunes upon the possibilities of the future.

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[1] Virginia City Territorial Enterprise, May 3, 1881.

Seasons of borrasca bring to view the best qualities of men like these. The cool judgment which weighs chances and indications without bias or obstinacy, the faith which no discouragements can shake, the resolution which overrides obstacles and holds fast in spite of delays, then become apparent to all. To these traits is largely attributable the success already won. Of the future no one can predict, but the past, at least, is secure. No fair observer can be blind to its record and ascribe its achievements to chance alone. Luck is the open sesame of the fatalist and sluggard; it will not clear the way to all treasure-chambers nor keep their doors from closing. Fortune sometimes favors fools, but never long, and men who fail to use opportunities aright soon have no opportunities to misuse. Herein lies the true reason why their early good fortune was of so little advantage to the prospectors of 1859—the discoverers of the Comstock Lode. In 1860 Mackey, Fair, and Jones were poorer than Finney, Comstock, McLaughlin, and O'Riley, and were far less able to avail themselves of the dawning opportunities for enrichment in the new silver district. Yet to-day what is the record? The three first-named are recognized as the foremost silver miners of America, and the Comstock Lode has been to them a veritable cave of Aladdin. The lucky prospectors, on the other hand, are dead and forgotten.

The toper, Finney, lived only a few years after locating his famous ledge, eking out a precarious livelihood by bartering feet in sundry claims in exchange for drink and food-money, and losing his life, at length, June 20, 1861, by falling from his horse and fracturing his skull.[1]

Comstock, the loud-voiced impostor, distinguished himself by seducing and buying a wife from a Mormon for a horse, a revolver, and sixty dollars in money, but could not keep her from running away at the first opportunity. He offered a reward of $100 for the capture and return of his runaway slave, or spouse, and thus regained her only to lose her irrecoverably a few months later.[2] Then he bought less migratory chattels and opened two supply stores at Carson City and Silver City, but, as his customers usually paid him in promises, which he accepted as cash, he was soon bankrupt and became again a prospector.[1] His past success and the hardships of his wandering life turned his poor brain. In fancy he still owned the Comstock Lode and even the cities on its line. Yet with princely kindness he suffered his tenants to live rent-free, "for the winters are cold," he babbled, "and the people poor, and their need is greater than mine."[2] So the cities grew and the mines yielded bonanza after bonanza, while their landlord was toiling for bread among the bleak hills of the northern Territories. At length he was tired of drifting from camp to camp, and in a fit of despair and distraction blew out his brains September 27, 1870, and was buried without a headstone in Bozeman, a little mining camp of Montana.[3]

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[1] The Territorial Enterprise, April 19, 1863; Reproduction of sketch published in 1861. The Big Bonanza, p. 87.

[2] The Big Bonanza, pp. 77-80.

Peter O'Riley wasted his fortune in absurd mining projects and other foolish speculations. He had wandered away from the Washoe district only to return to it in 1867 with small means but great expectations. His brain teemed with visions of wealth and spiritualistic delusions. Relying on the guidance of angelic retrospectors he began work upon a tunnel in a desolate place among the foot-hills of the Sierra Nevada Mountains. The hill-side which he wished to pierce was only "a bed of rotten granite," as a well-informed observer[4] declared in a sketch, whose conclusion is here most apposite and interesting: "Here O'Riley toiled alone for two or three years under all manner of difficulties. The ground in which he was at work was full of water, and caves frequently occurred in his tunnel. The work of many weeks was often lost in a moment by a cave which crushed in his timbers and drove him back almost to where he first began; but the spirits said there was a whole mountain of silver and gold ahead, and he believed them and persevered. He was without money but not without friends. One and another of his friends among the old settlers purchased for him what he required in the way of provisions and tools. As he worked alone in his dark tunnel month after month, far under the mountain, the spirits began to grow more and more familiar. They swarmed about him, advising and directing the work. As he wielded pick and sledge their voices came to him out of the darkness which walled in the light of his solitary candle, cheering him on; voices from the chinks in the rocks whispered to him stories of great masses of native silver at no great distance ahead, of caverns floored with silver and roofed with great arches hung with stalactites of pure silver and glittering native gold. The spirits talked so much with him in his tunnel under the mountain, and had made themselves so familiar there, that at last they boldly conversed with him under the broad light of day, and in the city as well as in the solitude of the mountains. He was heard muttering to them as he walked the streets, and a wild and joyous light gleamed in his eyes as he listened to their promises. News at length came that O'Riley had been caved on and badly hurt; then that the physicians had pronounced him insane. When he recovered from his hurt he was anxious to return to his tunnel—the spirits under the mountain were calling to him; but he was sent to a private asylum for the insane at Woodbridge, California, and in a year or two died there, the spirits to the last lingering about him and heaping on him reproaches for having left the golden mountains and silver caverns they had pointed out to him.[1]"

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[1] The Big Bonanza, p. 80.

[2] Montana Post, August 21, 1867.

[3] E. C. Addison, editor of the Bozeman Avant Courier, eye-witness of Comstock's death; Letter dated February 28, 1880.

[4] William Wright, ("Dan de Quille,") City Editor of Territorial Enterprise.

The most honest and hard-working of the company, Patrick McLaughlin, struggled along with little judgment and general ill-fortune, serving at last as a cook for a party of miners in San Bernadino County, California, where he fell sick two years ago (1879), and died in the county hospital without leaving enough to pay for a pauper's burial.[2]

To judge from the typical history of the Washoe district, in the discovery of rich ledges the element of chance largely enters, as witness the comparative fortune of the Grosch brothers and their ignorant companions; but for the development of bonanzas, skill, perseverance, and energy make chance subordinate and can almost constrain the smiles of fortune. When to these traits which have distinguished the management of the Comstock mines a just regard for the interests of every stockholder shall be added—when stock gambling shall come to an end, and shares shall be bought for the sake of developing the mines and reaping the legitimate returns of such an investment—when the body of miners shall see the folly and unfairness of their arbitrary standard of wages—then the Comstock Lode will be indeed a field of industry to which the American people may point with less qualified pride; but there is reason to fear that the mines will be deserted before these Utopian reforms are effected.

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[1] The Big Bonanza, pp. 98, 99.

[2] C. G. Campbell, M. D., County Physician, San Bernadino; Letter dated April 20, 1880.

APPENDIX.

TABLE I.—*Location of mines.*

RECORD BOOKS.	NUMBER OF LOCATIONS IN— Virginia District.	Gold Hill District.	Years.	Outside Districts.
Letter A.	262	234	1859	5
" B	710	680	1860	2
" C	422	741	1861	1
" D	330	200	1862	85
" E	259	161	1863	28
" F	309	360	1864	24
" G	290	335	1865	1
" H	662	599	1866	23
" I	241	69	1867	17
" J	......	188	1868	35
" K	261	195	1869	19
" L	384	390	1870	18
" M	908	641	1871	39
" N	264	179	1872	56
" O	188	156	1873	48
" P	417	361	1874	102
" Q	21	24	1875	255
" R	370	326	1876	120
" S	841	638	1877	72
" T	390	195	1878	165
" U	38	33	1879	78
" V	151	156	1880	44
" W	528	468		
" Y	45	29		
" Z	14	6		
TOTAL	8,305	7,364	....	1,237
	16,906			

TABLE II.—*Product of the Comstock district from 1860 to June 30, 1880.*

YEAR.	ORE EXTRACTED AND MILLED.		Average value of ore per ton.	PRODUCT IN BULLION.									
				From State Tax List.			Based on reports of U. S. Com'r.	From U. S. Monetary Commission, 1877.			J. D. Hague's Rep.—"Survey of 40th Par."	Estimate of Eliot Lord.	Rep. of John A. Church, E. M.
	Tons.	Lbs.		Ore.	Tailings.	Total.	Total.	Gold.	Silver.	Total.	Total.	Total.	Total.
1860	a 12,500		a $80 00				$1,000,000 00					$1,000,000 00	
1861	b 30,888		b 73 00				2,275,256 00				$2,000,000 00	2,500,000 00	
1862	c 96,031		c 65 50				6,247,047 00				6,000,000 00		
1863	d 249,724		d 50 00				12,486,238 00				12,400,000 00		
1864	e 367,339		e 43 00				15,795,585 00				16,000,000 00		
1865	f 410,402		f 37 00				15,184,877 00				16,000,000 00		
1866	g 480,239		g 29 50				14,167,071 00				11,739,100 00		
1867	h 451,289	1,580	h 30 62	$13,811,824 26		$13,811,824 26	13,738,618 00				13,738,618 00		
1868	h 337,023	660	h 36 85	12,418,023 25		12,418,023 25	8,499,769 00						
1869	h 279,584	1,000	h 23 79	6,683,478 24		6,683,478 24	7,528,607 00						
1870	h 237,047	210	h 28 66	6,795,926 73		6,795,926 73	8,319,698 00						
1871	h 409,100	1,768	h 25 03	10,240,850 07	$303,858 96	10,544,709 03	11,053,328 00	$4,077,027	$6,230,587	$10,307,614			
1872	h 384,669	990	h 31 70	12,196,399 65	394,275 50	12,590,675 15	13,569,724 00	6,310,035	6,611,943	12,921,978			
1873	h 448,266	970	h 49 88	22,359,575 53	308,148 43	22,667,723 96	21,534,727 00	10,493,796	11,037,023	21,530,819			
1874	h 526,743	1,712	h 42 66	22,472,444 90	52,830 25	22,525,275 15	22,400,783 00	12,579,525	11,881,000	24,460,525			
1875	h 540,424	274	h 47 95	25,915,521 54	107,479 00	26,023,000 54	26,023,026 00	11,739,873	14,492,350	26,232,223			
1876	h 598,460	1	h 63 11	37,768,659 20	240,486 56	38,048,145 76		18,002,906	20,570,078	38,572,984			
1877	h 562,515	1,300	h 64 51	36,291,536 70	770,715 68	37,062,252 38							$34,793,448 00
1878	h 272,909	958	h 72 04	19,661,394 11	775,291 20	20,436,685 31							19,878,034 00
1879	h 178,276	777	h 39 28	7,003,485 82	474,105 64	7,477,591 46							
June 30, 1880	h 94,136	1,350	h 20 21	1,903,132 68		1,903,132 68							

a Estimate based on Official Reports of Gould & Curry and Ophir Mining Companies, Territorial Enterprise, July 14, 1860; San Francisco Evening Bulletin, Aug. 7, 1860. Reports of Almarin B. Paul, March 18, 1863; March 21, 1863; October, 19, 1863.

b Estimate based on Official Reports of Gould & Curry and Ophir Mining Companies, Territorial Enterprise, February 2, 1861; March 30, 1861. Reports of Paul as above.

c Estimate based on Official Reports of Gould & Curry and Ophir Mining Co.'s; Table of Bullion Shipments by Wells, Fargo & Co.; Territorial Enterprise, Aug. 27, 1863. Reports of Paul as above.

d Estimate based on Official Reports of Gould & Curry, Savage, and Empire Mining Companies; Table of Bullion Shipments by Wells, Fargo & Co.; Territorial Enterprise, August 27, 1863. Report of Almarin B. Paul, October 19, 1863.

e Estimate based on Official Reports of seven mining companies, representing more than two-thirds of total yield.

f Estimate based on Official Reports of eight mining companies, representing more than two-thirds of total yield. State Tax List for 1st and 2d quarters of 1865, on file in Controller's Dep't.

g Estimate based on Official Reports of ten mining companies, representing more than two-thirds of total yield. State Tax List for quarter ending Dec. 31, '66, on file in Controller's Dep't.

h From the State Tax List on file in Controller's Department.

Table II—*Continued.—Total product of the Comstock district, 1860 to June 30, 1880.*

[Ore extracted and milled, 1860 to June 30, 1880—6,971,641 tons 640 pounds.]

Based on—	Produce for periods stated.	Total bullion product, 1860 to June 30, 1880.	Estimated value per ton (tailings included).
United States Commissioner's Reports, 1860 to 1866 ..	$67,156,074 00	....	....
State Tax List, 1867 to June 30, 1880	238,978,443 90	$306,134,517 90	$43 91
United States Commissioner's Reports, 1860 to 1875...	199,824,364 00	....	....
State Tax List, 1876 to June 30, 1880	104,927,807 59	304,752,171 59	43 71
United States Commissioner's Reports, 1860 to 1870 ..	105,242,766 00	....	....
United States Monetary Commission's Report, 1870 to 1876.	134,026,443 00	....	....
State Tax List, 1877 to June 30, 1880	66,879,661 83	306,148,870 83	43 91
Estimate of United States Commissioner and Lord, 1860.	1,000,000 00	....	....
Hague's Report, 1861 to 1867	77,877,718 00	....	....
State Tax List, 1868 to 1870	25,897,428 22	....	....
United States Monetary Commission's Report, 1871 to 1876.	134,026,443 00	....	....
State Tax List, 1877 to June 30, 1880	66,879,661 83	305,681,251 05	43 84
Estimate of United States Commissioner and Lord, 1860.	1,000,000 00	....	....
Estimate of Lord, 1861	2,500,000 00	....	....
Hague's Report, 1862 to 1867	75,877,718 00	....	....
State Tax List, 1868 to 1870	25,897,428 22	....	....
United States Monetary Commission's Report, 1871 to 1876.	134,026,443 00	....	....
State Tax List, 1877 to June 30, 1880	66,879,661 83	306,181,251 05	43 91
Average of five estimates	....	305,779,612 48	43 86

TABLE II—*Continued.—Proportions of gold and silver in Comstock bullion.*

[From official reports of the mining companies as far as accessible. The product is not in all cases thus segregated into gold and silver in the companies' reports. The figures quoted are of assay (not marked) values.]

SOURCE.	GOLD.	SILVER.	TOTAL.	PERCENTAGE.	
				Gold.	Silver.
GOLD HILL GROUP.					
Crown Point, from May 1, 1864, to May 1, 1877	$10,166,656 88	$13,762,812 77	$23,929,469 65		
Belcher, from January 1, 1871, to December 31, 1873	8,813,196 06	6,716,231 05	15,529,427 11		
Yellow Jacket, year ending June 1, 1872	170,133 12	363,123 80	533,256 92		
Imperial, from June 1, 1864, to May 31, 1870	1,973,021 60	2,588,138 85	4,561,160 45		
Empire, from December 21, 1864, to December 16, 1869	563,121 83	786,713 69	1,349,835 52		
Total for Gold Hill group	21,686,129 49	24,217,020 16	45,903,149 65	$47 25	$52 75
CENTRAL GROUP.					
Savage, July 1, 1866, to June 30, 1873	3,661,220 70	7,090,573 61	10,751,794 31		
Gould & Curry, December 1, 1865, to November 30, 1867	577,729 22	1,219,113 16	1,796,842 38		
Hale & Norcross, March 1, 1866, to January 31, 1874	2,772,468 28	4,774,187 26	7,546,655 54		
Chollar-Potosi, June 1, 1867, to May 31, 1874	3,868,488 14	6,314,261 66	10,182,749 80		
Total for Central group	10,879,906 34	19,398,135 69	30,278,042 03	35 93	64 07
BONANZA GROUP.					
Consolidated Virginia, to December 31, 1880	29,075,338 97	35,895,438 98	64,970,777 95		
California, to December 31, 1880	23,308,012 69	23,428,818 75	46,736,831 44		
Ophir, 1865 and 1875, 1876 and 1877	2,172,600 57	2,608,744 28	4,781,344 85		
Total for Bonanza group	54,555,952 23	61,933,002 01	116,488,954 24	46 83	53 17
RECAPITULATION.					
Gold Hill group	21,686,129 49	24,217,020 16	45,903,149 65		
Central group	10,879,906 34	19,398,135 69	30,278,042 03		
Bonanza group	54,555,952 23	61,933,002 01	116,488,954 24		
Total	87,121,988 06	105,548,157 86	192,670,145 92	45 22	54 78
Baron Von Richthofen's estimate of the yield of the Comstock to close of 1865	15,250,000 00	32,750,000 00	48,000,000 00	31 77	68 23
TOTAL	102,371,988 06	138,298,157 86	240,670,145 92	42 54	57 46

TABLE III.—*Financial showing of Washoe Mining Companies whose stocks were dealt in at the San Francisco Boards at the close of the Census year June 30, 1880:*

COMPANY.	DIVIDENDS.		ASSESSMENTS.		PROFIT.	LOSS.
	No.	Amount.	No.	Amount.		
WASHOE MINES	390	$115,871,100	1090	$61,715,535	$97,547,430	$43,391,865
Alpha Consolidated			12	330,000		330,000
Alta			17	1,317,600		1,317,600
Amazon Consolidated			6	54,000		54,000
American Flat			7	172,500		172,500
Andes			14	425,000		425,000
Atlantic Consolidated			3	45,000		45,000
Baltimore Consolidated			19	1,015,000		1,015,000
Belcher	38	15,397,200	22	1,990,000	13,407,200	
Benton Consolidated			3	102,000		102,000
Best & Belcher			17	942,590		942,590
Brilliant			4	25,000		25,000
Buckeye			19	332,000		332,000
Bullion			14	3,352,000		3,352,000
Caledonia			31	1,935,000		1,935,000
California	34	31,320,000			31,320,000	
Challenge Consolidated			1	10,000		10,000
Chollar			3	168,000		168,000
Confidence	6	78,000	11	256,320		178,320
Consolidated Imperial			11	1,125,000		1,125,000
Consolidated Dorado			1	50,000		50,000
Consolidated Virginia	51	42,390,000	15	411,200	41,978,800	
Consolidated Washoe			1	8,000		8,000
Cosmopolitan			5	125,000		125,000
Crown Point	50	11,588,000	41	2,373,370	9,214,630	
Crown Point Ravine			6	49,500		49,500
Daney	2	56,000	5	91,800		35,800
Dardanelles			7	390,000		390,000
Dayton			10	750,000		750,000
De Haro			2	25,000		25,000
Erie Consolidated			1	10,000		10,000
Europa			8	126,000		126,000
Exchequer			15	530,000		530,000
Fairfax			2	35,000		35,000
Flowery			3	100,000		100,000
Franklin			4	unknown		unknown.
George Douglas			3	45,000		45,000
Georgia			1	10,000		10,000
Golden Gate			1	100,000		100,000

TABLE III—*Continued.*

COMPANY.	DIVIDENDS.		ASSESSMENTS.		PROFIT.	LOSS.
	No.	Amount.	No.	Amount.		
Gould & Curry	36	$3,826,800	37	$3,152,000	$674,800	
Green			14	unknown		unknown.
Hale & Norcross	36	1,598,000	64	3,306,000		$1,708,000
Hartford			5	14,700		14,700
Insurance			3	18,000		18,000
Joe Scates			4	95,000		95,000
Julia Consolidated			12	1,229,000		1,229,000
Justice			32	3,230,000		3,230,000
Kentuck	32	1,252,000	13	300,000	952,000	
Kossuth			8	421,200		421,200
Lady Bryan			4	200,000		200,000
Lady Washington			1	21,600		21,600
Lee			1	5,000		5,000
Leviathan			10	315,000		315,000
Mackey			3	35,000		35,000
Mary Ann			1	10,500		10,500
Maryland			1	5,400		5,400
Mexico			11	1,243,000		1,243,000
Midas			2	21,000		21,000
Mint			22	142,500		142,500
Mount Hood			3	35,000		35,000
Mountain View			1	25,000		25,000
Nevada			3	18,000		18,000
New York			22	900,000		900,000
Niagara			5	99,000		99,000
North Bonanza			5	175,000		175,000
North Carson			9	160,000		160,000
North Consolidated Virginia			16	820,000		820,000
North Sierra Nevada			2	10,000		10,000
Occidental			6	112,500		112,500
Ophir	24	1,595,800	35	2,689,400		1,093,600
Original Gold Hill			8	102,000		102,000
Original Keystone			3	125,000		125,000
Overman			45	3,162,800		3,162,800
Patten			2	20,000		20,000
Peytona			2	70,000		70,000
Phil. Sheridan			9	145,000		145,000
Pioneer			2	15,000		15,000
Potosi			3	168,000		168,000
Prospect			6	260,000		260,000

TABLE III—*Continued.*

COMPANY.	DIVIDENDS.		ASSESSMENTS.		PROFIT.	LOSS.
	No.	Amount.	No.	Amount.		
Sabine			2	$25,000		$25,000
Savage	52	$4,460,000	42	4,964,000		504,000
Scorpion			7	122,000		122,000
Segregated Belcher			16	264,000		264,000
Segregated Gold Hill			1	12,000		12,000
Senator			1	10,800		10,800
Sierra Nevada	11	102,500	63	3,850,000		3,747,500
Silver City			1	15,775		15,775
Silver Hill			10	1,620,000		1,620,000
Solid Silver			3	75,000		75,000
South Comstock			6	79,000		79,000
South Utah			4	35,000		35,000
Saint Louis			1	16,200		16,200
Succor	2	22,800	24	798,000		775,200
Sutro			4	25,680		25,680
Tolo			2	25,000		25,000
Trojan			12	315,000		315,000
Union Consolidated			14	860,000		860,000
Utah			30	1,030,000		1,030,000
Vancouver			3	35,000		35,000
Vermont Consolidated			2	44,000		44,000
Ward			5	198,000		198,000
Wells Fargo			14	264,600		264,600
Woodville Consolidated			6	630,000		630,000
Yellow Jacket	25	2,184,000	37	4,638,000		2,454,000

An analysis of the above shows that, of the 103 mining companies reported, 6 show an excess in amount of dividends over assessments, and 97 an excess in amount of assessments over dividends; 14 have paid dividends, and 102 have levied assessments; 1 has paid dividends and levied no assessments; 89 have levied assessments and paid no dividends; and 13 have paid dividends and levied assessments.

TABLE IV—*Assessments*, 1880-'81.

COMPANY.	ASSESSMENTS LEVIED FOR THE YEAR 1880.	ASSESSMENTS LEVIED FOR THE YEAR 1881.	ASSESSMENTS LEVIED FOR THE YEARS 1880-'81.
Alpha Consolidated	$60,000	$30,000	$90,000
Alta	108,000	216,000	324,000
Andes	50,000	50,000	100,000
Atlantic Consolidated	10,000		10,000
Best & Belcher	201,600	100,800	302,400
Belcher	390,000	234,000	624,000
Bullion	400,000	320,000	720,000
Benton Consolidated	108,000	54,000	162,000
Concordia (Virginia)	75,000		75,000
Caledonia	150,000	125,000	275,000
California		162,000	162,000
Chollar	168,000	56,000	224,000
Confidence		12,480	12,480
Consolidated Virginia		162,000	162,000
Consolidated Dorado		10,000	10,000
Crown Point	250,000	125,000	375,000
Consolidated Imperial	150,000	150,000	300,000
Exchequer	100,000		100,000
Fairfax	20,000		20,000
Flowery	10,000		10,000
Golden Gate	100,000		100,000
Gould & Curry	162,000	108,000	270,000
Hale & Norcross	392,000[a]	308,000	700,000
Julia Consolidated	132,000	66,000	198,000
Justice	157,500	52,500	210,000
Kentuck	9,000	33,000	42,000
Lady Bryan	25,000	25,000	50,000
Lady Washington		10 800	10,800
Leviathan	40,000	25,000	65,000
Mackey	60,000		60,000
Mountain View	25,000		25,000
Mexican	540,000	324,000	864,000
Morning Star		20,000	20,000
New Wells Fargo		5,000	5,000
New York	50,000	20,000	70,000
North Bonanza	50,000		50,000
North Sierra Nevada		10,000	10,000

TABLE IV—*Continued.*

COMPANY.	ASSESSMENTS LEVIED FOR THE YEAR 1880.	ASSESSMENTS LEVIED FOR THE YEAR 1881.	ASSESSMENTS LEVIED FOR THE YEARS 1880-'81.
Occidental	$20,000	....	$20,000
Original Gold Hill	3,000	....	3,000
Ophir	453,600	$201,600	655,200
Original Keystone	50,000	75,000	125,000
Overman	230,400	172,800	403,200
Potosi	168,000	112,000	280,000
Phil Sheridan	25,000	10,000	35,000
Prospect	10,000	10,000	20,000
Solid Silver	25,000	....	25,000
Savage	392,000	252,000	644,000
Scorpion	75,000	35,000	110,000
Segregated Belcher	6,400	19,200	25,600
Silver Hill	199,800	81,000	280,800
Silver City	....	6,310	6,310
Sierra Nevada	600,000	500,000	1,100,000
Trojan	....	10,000	10,000
Union Consolidated	100,000	200,000	300,000
Utah	120,000	220,000	340,000
Wells Fargo	10,800	....	10,800
Yellow Jacket	480,000	360,000	840,000
Total assessments	$6,962,100	$5,079,400	$12,041,590
Total dividends			$370,800
Excess of assessments			$11,670,790

DIVIDENDS.

Consolidated Virginia (August 7, 1880)	$270,000
Ophir (January 12, 1880)	100,800
Total	$370,800

TABLE V.—*The highest and lowest prices of Comstock mining stocks sold in San Francisco Exchange from* 1868 *to* 1879.

[Compiled from the "Commercial-Herald" and "Daily Stock Report."]

COMPANY.	1868.				1869.				1870.			
	HIGHEST.		LOWEST.		HIGHEST.		LOWEST.		HIGHEST.		LOWEST.	
	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.
	$		$		$		$		$		$	
Alpha Consolidated	1,570	February	33	September	62	February	11	October	21	March	3	September.
Alta												
Amazon												
American					65	May	1/16	September				
American Flat												
Andes												
Atlantic Consolidated												
Bacon												
Baltimore Consolidated												
Belcher	430	April	110	July & Nov	207½ 35	January February	207½ 12	January September	55	Mch. & Apl	1	October.
Benton												
Best & Belcher												
Bowers												
Brilliant												
Buckeye												
Bullion	380	June	8	September	34	January	7	October	10	Jan. & Feb	4	F'b, Apl, M'y, June, & Jul.
Caledonia												
California												
Challenge												
Chollar												
Chollar-Potosi	355	April	118	November	467 25	May November	160 13	February September	91	December	18	January.
Chonta												
Cole	23	December	10	November	12	March	5½	April				
Confidence	155	June	24	November	55	June	20	Sept. and Oct.	40	March	5	O't, N'v, & D.
Consolidated Gold Hill												
Consolidated Virginia									17	March	1	July.
Consolidated Washoe												
Cosmopolitan												
Crown Point	2,450 140	March May	665 40	January November	74	February	11	Oct. and Nov.	28	March	2	November.
Crown Point Ravine												
Daney	227	June	3	September	5¾	March	¾	October	7¼	December	1/16	January.
Dardanelles												
Dayton												
Eclipse												
Empire												
Empire Mill	325	April	100	October	131	January	16	September	40	March	1	S'p, O't, & N.
Erie Consolidated												
Europa												
Exchequer	96	April	9½	September	31	Jan. & Feb	4	September	15	Apl. & May	5	J'e, J'y, A'g, S'p, N., & D.
Fairfax												
Flowery												

TABLE V—*Continued.*

COMPANY.	1868.				1869.				1870.			
	HIGHEST.		LOWEST.		HIGHEST.		LOWEST.		HIGHEST.		LOWEST.	
	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.
	$		$		$		$		$		$	
Franklin												
Gold Hill Quartz	150	April	46	November	65	January	23	October	35	January	2½	October.
Gould & Curry	850 116½	February June	325 78	May August	126	May	58	September	500	March	37	July.
Green												
Hale & Norcross	7,100 131	February May	1,260 44	January September.	205	May	44	January	164	February	83	July & Sept.
Hartford												
Imperial	272½	March	88	November	149½	January	29	September	51	January	11	December.
Imperial Consolidated												
Independent												
Jacob Little												
Joe Scates												
Julia	6	Oct. and Nov.	2½	November	5½	January	½	October	6	July & Oct.	½	J'y, A'g, & S.
Justice									3	Feb. & Mar.	1	April.
Justice and Independent	42	April	2	August	21	February	2	Sept. and Oct.				
Kentuck	505	April	136	December	285	March	42	May	146	January	24	October.
Kossuth												
Lady Bryan	82½	April	6	November	60	June	6	February	6½	Jan. & Mar.	½	July.
Lady Washington												
Mackey												
Mary Ann												
Maryland												
Mexican												
Midas												
Mint												
Mountain View												
Nevada												
North Carson												
North Consolidated Virginia												
North Ophir												
North Sierra Nevada												
North Star	105	October	79	August	77	May	77	May				
Occidental									19	March	1/16	November.
Ophir	280	April	12½	June	49	February	11	September	27	April	2	October.
Original Gold Hill												
Original Keystone												
Oro												
Overman	252½	April	33	January	108	June	50	March	26	March	3	December.
Patton												
Peytona												
Phil Sheridan												
Picton												
Pioneer												
Potosi												
Rock Island												
Saint Louis												

TABLE V—*Continued.*

COMPANY.	1868.				1869.				1870.			
	HIGHEST.		LOWEST.		HIGHEST.		LOWEST.		HIGHEST.		LOWEST.	
	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.
	$		$		$		$		$		$	
Savage	200	February	63	November	121½	May	32	September	55	April	26	November.
Scorpion												
Segregated Belcher	32½	April	5½	November	12	May	5	May	12	April	1	Jan., A'g, S'p, Nov., & Dec.
Segregated Gold Hill												
Segregated Rock Island												
Senator												
Sierra Nevada	40	August	10	March	310 14½	April November	31 7	February August	23	December	5	Feb. & Mch.
Silver Hill												
Solid Silver												
South Comstock												
South Lady Bryan												
South Overman												
South Potosi												
South Sierra Nevada												
South Star												
South Utah												
Succor												
Sutro												
Trench												
Trojan												
Union Consolidated												
Union M. & M.									19½	September	7	October.
Utah												
Vivian												
Ward												
Wells Fargo												
Woodville												
Yellow Jacket	1,650	April	606	January	1,650 80	January May	1,362½ 23	January October	55	Jan. & April	24	September.

TABLE V—*Continued.*

COMPANY.	1871.				1872.				1873.			
	HIGHEST.		LOWEST.		HIGHEST.		LOWEST.		HIGHEST.		LOWEST.	
	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.
	$		$		$		$		$		$	
Alpha Consolidated	20	Sept. and Oct.	3	January	240	April	14	January	100	December	15	July.
Alta												
Amazon												
American												
American Flat									10½	May	½	February.
Andes												
Atlantic Consolidated												
Bacon					95	April & July.	9	November	8½	June	1½	August.
Baltimore Consolidated					9	April	1½	June	12½	June	½	April.
Belcher	450	December	6½	January	1,525	April	6½	January	113	June	60	March.
Benton												
Best & Belcher					8½	September	5	December	47	December	2½	March.
Bowers												
Brilliant												
Buckeye	6	October	1	March	14½	April	½	November	3	F'b, M'y, & D.	½	July & Aug.
Bullion					100	April	50	May	34	December	12	October.
Caledonia					145	April	9	March	48	December	9½	April.
California												
Challenge												
Chollar												
Chollar-Potosi	90	April	27	September	380	April	23½	January	75	June	34	Mar. & Sept.
Chonta												
Cole												
Confidence	25	March	10	March	205	May	4½	June	13½	February	5	July & Oct.
Consolidated Gold Hill												
Consolidated Virginia	18½	April	1½	February	160	April	15	June	110	July	35	March.
Consolidated Washoe												
Cosmopolitan												
Crown Point	470	December	15½	January	1,825	May	75	October	142	December	77	August.
Crown Point Ravine												
Daney	12½	September	3	February	9½	April	½	December	4	December	½	Jan., Feb & March.
Dardanelles					21	April	3	May				
Dayton												
Eclipse									10½	Jan. & Feb.	3½	July.
Empire												
Empire Mill	25	May	1	April	19½	July	5	September	10½	May	2½	September.
Erie Consolidated												
Europa												
Exchequer	18½	September	3	Jan. and Feb.	90	April	7½	June	55	December	6½	July.
Fairfax												
Flowery												
Franklin												
Gold Hill Quartz	178	June	37	February	560	April	90	May	190	January	6½	March.
Gould & Curry												
Green	145	July	51	April	750	April	20	September	92½	January	17	July.
Hale & Norcross												

TABLE V—*Continued.*

COMPANY.	1871.				1872.				1873.			
	HIGHEST.		LOWEST.		HIGHEST.		LOWEST.		HIGHEST.		LOWEST.	
	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.
	$		$		$		$		$		$	
Hartford	85	May	3½	September	480	April	4	June	10½	May	2¾	September.
Imperial												
Imperial Consolidated	5¾	October	3	December	11	May	½	October	4½	Nov. and Dec.	¼	April.
Independent												
Jacob Little												
Joe Scates	2½	Jan. and Feb.	1/16	August	26	April	2	December	7¼	December	⅛	April.
Julia					47½	April	1	May	19	December	3	Mar. & April.
Justice												
Justice and Independent	191	June	27	February	700	May	2½	May	42	December	6	April & July.
Kentuck												
Kossuth												
Lady Bryan												
Lady Washington												
Mackey												
Mary Ann												
Maryland												
Mexican												
Midas												
Mint												
Mountain View												
Nevada												
North Carson												
North Consolidated Virginia												
North Ophir												
North Sierra Nevada												
North Star												
Occidental	33½	December	3½	January	3	September	1½	November	5	May	⅛	February.
Ophir					140	April	21	June	295	December	15	April.
Original Gold Hill												
Original Keystone												
Oro	41	September	2	Jan. and Feb.	270	April	30	January	140	December	10	October.
Overman												
Patton												
Peytona												
Phil Sheridan												
Picton												
Pioneer												
Potosi												
Rock Island												
Saint Louis	80	March	33	August	725	April	30	January	310	February	30	August.
Savage												
Scorpion	45	October	1½	Jan. and Feb	290	April	49	October	197	December	26	April.
Segregated Belcher												
Segregated Gold Hill												
Segregated Rock Island												
Senator	33	December	9	August	130	July	11	August	72	February	7½	April & July.
Sierra Nevada					20	April & May	1½	February	32½	May	5½	January.

TABLE V—*Continued.*

COMPANY.	1871.				1872.				1873.			
	HIGHEST.		LOWEST.		HIGHEST.		LOWEST.		HIGHEST.		LOWEST.	
	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.
	$		$		$		$		$		$	
Silver Hill												
Solid Silver												
South Comstock												
South Lady Bryan												
South Overman												
South Potosi												
South Sierra Nevada												
South Star												
South Utah	10	March	2½	May	13	April	1	December	9	February	½	July.
Succor												
Sutro												
Trench												
Trojan												
Union Consolidated					14	April	1½	June	30	December	½	
Union M. & M					6½	May	1	November				Ap'l,Jun.,Jul.
Utah												
Vivian												
Ward												
Wells Fargo												
Woodville					8	November	2	June	5½	May	½	Sept. & Oct.
Yellow Jacket	99	May	37	January	325	May	16	July	126	December	30	July.

TABLE V—*Continued.*

COMPANY.	1874.				1875.				1876.			
	HIGHEST.		LOWEST.		HIGHEST.		LOWEST.		HIGHEST.		LOWEST.	
	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.
	$		$		$		$		$		$	
Alpha Consolidated	99	January	9	February	45	June	3½	June	67	May	18½	December.
Alta	3	Sept. & Oct	1	Oct. and Dec.	6	April	1½	Jan., Feb., & March.	5	January	1½	October.
Amazon					3½	December	⅛		2½	January	⅜	Aug. & Sept.
American												
American Flat	17½	September	4½	March	9½	Jan. & April	⅛	December	2½	Jan. and Feb	⅛	June & Nov.
Andes	6½	November	½	July & Aug.	16½ 7	Jan. & Mar April	4½ 2	February July	5½	Jan. & Mar	1½	December.
Atlantic Consolidated												
Bacon	12½	December	2½	May	10	January	3	February	10½	April	6	March.
Baltimore Consolidated	14½	October	5	Feb. & June	11	January	1	October	5½	February	1	June.
Belcher	120	January	42½	November	57½	January	14	October	40	March	8½	December.
Benton												
Best & Belcher	84	December	10½	September	89	January	32	November	69	January	38½	December.
Bowers	4	July	4	July								
Brilliant												
Buckeye	3½	October	½	August	2½	December	½	April	2½	December	½	September.
Bullion	40	January	6½	June	64	May	19	February	68	March	18½	December.
Caledonia	44	January	15	July & Aug.	37	January	12½	February	73½ 15	March March	24½ 7	January. July.
California	530	December	37	September	790 80	January January	240 46	January February	95	March	43	December.
Challenge	18	December	2	July	16	January	4	October	8½	March	2	Nov. & Dec.
Chollar												
Chollar-Potosi	96	December	46	July	128	August	40½	November	165	March	66	November.
Chonta					1½	December	1	December				
Cole												
Confidence	52	December	7	June	59	January	15	November	32	March	8½	December.
Consolidated Gold Hill	9	December	1	June								
Consolidated Virginia	610	December	55	February	700	January	210	October	481½ 90	January March	408 35½	February. December.
Consolidated Washoe	6	March	1½	January								
Cosmopolitan					1½	Jan. & Mar	⅛	April	⅛	March	1/16	June.
Crown Point	140	January	42	December	47½	January	21	October	29	January	5½	December.
Crown Point Ravine	2½	September	⅛	July, Nov., and Dec.	1½	January	½	April	⅛	January	1/16	July.
Daney	4½	September	1	April	5	January	½	Apr., June, and July.	2	March	½	Apr. & June.
Dardanelles	25	December	2	June	30	January	1	February	2½	Feb. & Nov	½	September.
Dayton	10	January	3½	December	6½	January	1	February	7½	May	2	December.
Eclipse	16	January	4½	May	14½	January	5	Feb., Oct., and Dec.	11	April	4	February.
Empire					3½	May	½	July and Oct.				
Empire Mill	18½	January	2½	May	18	January	4	May & June	13½	April	5½	February.
Erie Consolidated									1½	March	1	Mar. & Apr.
Europa	2½	March	2	March	3	May & Aug.	⅛	December	1½	January	½	January.

TABLE V—*Continued.*

COMPANY.	1874.				1875.				1876.			
	HIGHEST.		LOWEST.		HIGHEST.		LOWEST.		HIGHEST.		LOWEST.	
	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.
	$		$		$		$		$		$	
Exchequer	275	November	12½	February	425 16	January October	130 10	February Nov. & Dec.	27	March	8½	December.
Fairfax												
Flowery												
Franklin	5¼	October	1	Mar. & April.	1½	April & July.	1¼	Apr. & July	1	May	1	May.
Gold Hill Quartz	9	December	1	Mar. & June.	8	January	2¼	Feb. & Oct	7	April	3	Jan. & Feb.
Gould & Curry	63	December	14	November	75½	January	13	November	24½	March	10½	November.
Green												
Hale & Norcross	89	January	35	May	78	August	28	November	82½ 12½	March June	40 5½	February. December.
Hartford	1½	September	1½	September								
Imperial	21	December	4½	May	23½	January	5½	May				
Imperial Consolidated									21 7	April April & June.	8½ 1½	Jan. & Feb. December.
Independent	2¼	January	¼	June & Sept	2	January	1	January				
Jacob Little	5	January	2	March	3	Jan. & Feb	¼	Apl. & Oct				
Joe Scates												
Julia	12	December	1½	June	41	August	4½	Feb. & Mch	18½	January	3½	December.
Justice	102	December	3	July	195 51	August December	50 20	February August	33½	Jan. & Mch	16½	October.
Justice and Independent												
Kentuck	36	January	12	July	34	January	11	October	22	March	7½	December.
Kossuth	14	January	⅛	Aug. & Sept	5½	January	¼	June & July	5½	March	¼	June.
Lady Bryan	5	December	¼	February	17	January	⅜	October	7	January	1/16	December.
Lady Washington	5½	January	1½	December	5	January	1	Feb., May, J'ne & Jul.	5	January	1¼	December.
Mackey												
Mary Ann												
Maryland					2½	May	⅛	October	⅛	December	1/16	January.
Mexican	50	December	15	December	85	January	14½	May	45½	March	16½	December.
Midas	13½	October	5	January	15	January	2½	October	9	January	5	April.
Mint	⅛	January	⅛	August	1½	January	1/16	May	⅛	March	⅛	November.
Mountain View												
Nevada	2¼	March	1	August	2	January	¼	October	⅛	Jan. & Mch	⅛	Jan. & Feb.
North Carson	3	Nov. & Dec	2	October	5½	January	1/16	June	⅛	January	1/16	May.
North Consolidated Virginia									2	January	1½	Aug. & Dec.
North Ophir									2	March	2	March.
North Sierra Nevada												
North Star												
Occidental	8	December	2½	Oct. & Nov	8	January	1½	March	7	March	1½	December.
Ophir	315	January	8½	May	315	January	35½	October	76	March	20	December.
Original Gold Hill									3½	January	¼	June.
Original Keystone												
Oro												
Overman	145	January	22½	June	99	January	37	October	122	December	53½	June.
Patten	2	February	¼	May, Aug., & Sept.								

TABLE V—*Continued.*

COMPANY.	1874.				1875.				1876.			
	HIGHEST.		LOWEST.		HIGHEST.		LOWEST.		HIGHEST.		LOWEST.	
	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.
	$		$		$		$		$		$	
Peytona												
Phil Sheridan												
Picton	2	January	½	May & Nov.	1½	January	1/16	December	3/16	April	1/16	April.
Pioneer					2	Apl., May, & June.	1	Mar., Apl., & May.				
Potosi												
Rock Island	9	December	1	May	13	July	2	October	5	Jan. & Mar	¼	December.
Saint Louis												
Savage	106	December	46	July	190 22	January December	66 13½	October December	27	January	9	Nov. & Dec.
Scorpion					5½	January	2	January				
Segregated Belcher	255	October	27	August	165	January	40	October	110	January	62	November.
Segregated Gold Hill					2½	Aug. & Dec.	¼	June				
Segregated Rock Island									1	January	¼	January.
Senator	3½	January	2½	July	2½	January	¼	March	1	Jan., Feb., M'h, & Apr.	¼	October.
Sierra Nevada	28½	June	4½	September	27	January	9	November	28½	January	8½	December.
Silver Hill	15	January	4½	July	16	January	7	Aug. & Oct	14	January	6½	July.
Solid Silver												
South Comstock	3	December	½	August	3	Jan. & Aug	3	Jan. & Aug				
South Lady Bryan												
South Overman	1½	January	¼	Feb., Ap'l, J'y, & Aug.	15	June	15	June				
South Potosi												
South Sierra Nevada												
South Star	3½	January	2½	January								
South Utah												
Succor	7	December	1	May & July	9	January	¼	Oct., Nov., and Dec.	3½	January	1/16	October.
Sutro	6	January	¼	April	3	January	1½	January				
Trench	16	December	4	Feb., Mar., and July.	16	July	6	Feb. & May				
Trojan									2	January	¼	June.
Union Consolidated	97	December	10	July & Aug.	95 14½	January January	72 5½	January June	24½	March	8	December.
Union M. & M												
Utah	13	December	1	May	17½	December	3	February	34	March	12	December.
Vivian									2½	March	1	Mar. & Apr.
Ward	3½	December	3	December	7	January	2½	July	3½	April	½	December.
Wells Fargo					1½	January	1/16	October	1/16	June	1/16	December.
Woodville	10½	October	½	June	6½	January	1½	June & Aug.	4	March	½	December.
Yellow Jacket	180	December	64	May	170	January	60	Oct. & Nov.	130 49½	January March	100 13½	March. December.

TABLE V—*Continued.*

COMPANY.	1877.				1878.				1879.			
	HIGHEST.		LOWEST.		HIGHEST.		LOWEST.		HIGHEST.		LOWEST.	
	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.
	$		$		$		$		$		$	
Alpha Consolidated	23	January	5¼	May	24½	September	5½	April	37½	June	6	December.
Alta	23½	December	7/16	May	28½	January	3	March	12½	July	1 3/16	December.
Amazon	⅛	Oct. & Nov	⅛	Oct. & Nov	¼	February	¼	February				
American												
American Flat	2	December	1/16	April & Oct								
Andes	2¼	January	⅛	May	2	September	⅛	May	1⅛	September	¼	May.
Atlantic Consolidated									⅛	June & Aug	¼	May & June.
Bacon												
Baltimore Consolidated	2½	January	1/16	April	3½	Oct. & Nov	¼	M'ch, April, and May.	2½	June	¼	Ap., May, J'e, Aug. & Sep.
Belcher	11	January	2 3/16	May	16	September	2 1/16	May	9½	March	3½	October.
Benton	4 1/16	December	3/16	April	13	September	¼	March	8¼	June	½	December.
Best & Belcher	41	January	7½	May	30½	September	10½	May	26	February	7½	December.
Bowers												
Brilliant					2	September	¼	September	¼	March	¼	April.
Buckeye	½	April	⅛	April								
Bullion	20½	January	1⅞	May	26	September	3	April & May	10	October	2 3/16	December.
Caledonia	13	January	⅞	May	6½	September	1¼	April	3⅜	February	½	December.
California	53	January	23½	May	34	March	7½	July	11½	January	2 3/16	December.
Challenge	3½	January	½	May	3	September	1½	July	5½	February	1½	Jan. & Dec.
Choller									9½	May	4½	December.
Chollar-Potosi	80	January	15½	May	70	September	21½	May	53	January	35½	March.
Chonta												
Cole												
Confidence					14	September	3	May	23	February	4	December.
Consolidated Gold Hill												
Consolidated Virginia	55	January	21½	November	26	January	7	July, Nov., & Dec.	9⅝	January	3	December.
Consolidated Washoe	½	September	1/16	Sept. & Oct	3½	November	½	Jan., May, and June.	3 1/16	January	3/16	June.
Cosmopolitan					3/16	November	3/16	November	⅛	June	¼	May.
Crown Point	10	February	2½	July	1⅜	September	3	April & May	23½	December	⅜	December.
Crown Point Ravine	½	January	¼	January	7/16	Aug. & Oct	3/16	July	3/16	August	3/16	May.
Daney	⅜	Oct., Nov., & December.	1/16	December	⅜	August	¼	August				
Dardanelles	3½	November	⅜	July	1 1/16	December	1	Nov. & Dec	5½	February	⅜	October.
Dayton	1½	January	1/16	April	⅜	June	1/16	April & May	¼	February	¼	February.
Eclipse												
Empire												
Empire Mill												
Erie Consolidated									⅜	June	¼	June.
Europa									¼	July	¼	July.
Exchequer	13½	September	1	May	11½	September	1 3/16	April	12	June	1½	December.
Fairfax					4½	November	3½	October	1⅛	June	3/16	October.
Flowery					2 3/16	November	3/16	December	1 1/16	August	1/16	December.
Franklin												
Gold Hill Quartz												

TABLE V—*Continued.*

COMPANY.	1877.				1878.				1879.			
	HIGHEST.		LOWEST.		HIGHEST.		LOWEST.		HIGHEST.		LOWEST.	
	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.
	$		$		$		$		$		$	
Gould & Curry	20¼	June	2 3/10	May	29¼	September	4	May	16¼	January	3½	December.
Green									1¼	June	⅞	May.
Hale & Norcross	13¼	December	1	April	44	September	4½	May	21½	February	5	December.
Hartford												
Imperial												
Imperial Consolidated	2 1/10	January	1/10	May & June	1 1/16	September	1/10	May	2⅜	June	½	December.
Independent												
Jacob Little												
Joe Scates	1	June & July	1/10	December	3/10	Jan. & Feb	1/10	Jan. & April.				
Julia	7½	February	3/10	May	8½	June	1¼	Jan. & Feb	6¼	February	¼	December.
Justice	20⅜	January	2¼	May	12½	January	3¼	May & Dec	5⅜	July	⅜	December.
Justice and Independent												
Kentuck	8¼	January	2	May	11	September	2	May	8	Jan. & Feb	2¼	December.
Kossuth	1¼	January	1/10	April	⅞	September	1/10	May & Aug	¼	January	1/10	Aug., Sept., Feb., Dec., Mar., Apr., & May.
Lady Bryan	1	August	1/10	March	6	August	½	December	2	Feb., May	1/10	December.
Lady Washington	13¼	December	½	June & Aug.	17¼	August	2¼	Mar., June.	3	June	3/16	December.
Mackey					6	September	4¼	December	4 1/16	March	1/10	December.
Mary Ann					1	November	1	November	1/16	September	½	May.
Maryland									⅝	February	3/10	June.
Mexican	23	January	3¼	May	99¼	September	7	May	47½	February	14	December.
Midas					2¼	June	½	October	1¼	June	¼	January.
Mint	3/10	December	1/10	February								
Mountain View									8	May	1	December.
Nevada												
North Carson	⅞	Oct. & Nov	1/10	May	¼	September	1/10	January	3/10	November	1/10	Oct., Nov., & December.
North Consolidated Virginia	2	January	1/10	April	12¼	November	1/10	April	14¼	February	5¼	January.
North Ophir					3¼	September	¼	Oct. & Nov				
North Sierra Nevada					2¼	September	1/10	December	3/10	June	1/10	Jan., Feb., & March.
North Star												
Occidental	2¼	June	¼	May	1 1/16	August	½	May	5½	September	½	December.
Ophir	56	December	9½	April	98	September	24½	March	44	September	15½	December.
Original Gold Hill					⅞	October	½	December				
Original Keystone					7¼	September	5	September	3¼	November	3¼	November.
Oro									⅝	Nov. & Dec	1/10	December.
Overman	119	January	4	May	29	September	7¼	May	13	June	2	December.
Patten												
Peytona	1 1/16	July	¼	June, Oct., & Nov.	4	September	1	August	1	Feb., May, & August.	1	Feb., May, & August.
Phil Sheridan					3 3/10	September	3/10	December	1	May & June.	1/10	April.
Picton												
Pioneer									3/16	June	1/10	May.

TABLE V—*Continued.*

COMPANY.	1877.				1878.				1879.			
	HIGHEST.		LOWEST.		HIGHEST.		LOWEST.		HIGHEST.		LOWEST.	
	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.	Price.	Month.
	$		$		$		$		$		$	
Potosi									7	June	2	May.
Rock Island	¼	January	1/10	April	¼	Sept. & Nov.	1/10	Jan. and Feb.				
Saint Louis					1½	August	¼	Jan., Feb., Mar., Aug., and Nov.				
Savage	14¼	December	2 1/10	April	29	September	7¼	March	17¼	May	3¼	December.
Scorpion					20	September	⅛	December	4 1/10	November	¼	January.
Segregated Belcher	61	January	11	May	48	September	17	December	36	March	10	December.
Segregated Gold Hill												
Segregated Rock Island												
Senator	4½	Oct. and Nov.	1	October	4½	March	¾	Oct. and Dec.	⅛	February	1/10	Mar. & Dec.
Sierra Nevada	9¼	January	¼	May	261	September	2¼	March	86¼	October	17	December.
Silver Hill	{8 {3½	Jan. & Sept. December	1/10 1 1/16	May Oct. & Nov.	4¾	January	3/10	April & May.	3	May & June	11/16	December.
Solid Silver	8	December	3 7/10	July	9	September	7/10	November	1 1/10	January	3/10	May & Oct.
South Comstock	1	Sept. & Oct.	¼	June	1	September	1/10	January				
South Lady Bryan					1¼	October	¼	November				
South Overman												
South Potosi												
South Sierra Nevada					3/10	October	3/10	October	2¼	March	1/10	November.
South Star												
South Utah									3/10	March	3/10	July, Aug., Sept., and Nov.
Succor	5¾	December	7/10	January	5	September	1/10	June	1¼	January	1/10	June & Sept.
Sutro					¼	November	3/10	September	⅛	January	⅛	January.
Trench												
Trojan	2	October	7/10	May & July.	15/16	February	¼	Oct., Nov., D'r, Mar., May, and June.	⅜	January	3/10	A'l, M'y, J'y, Aug., Nov., & Dec.
Union Consolidated	11¼	January	1⅜	May	193	October	3	May	99	June	26¼	July.
Union M. & M.												
Utah	20¼	June	2 3/10	May	58	September	6¼	May	32	May	6	December.
Vivian	1⅞	October	1¼	Sept. & Oct.								
Ward	1¼	October	1/10	May	4¼	August	3/10	January	3½	September	¼	May.
Wells Fargo	7/10	November	1/10	Jan. Feb. Mar.	3/10	September	1/10	July, Aug., June, Mar., and April.	⅜	June		
Woodville	3	December	¼	April	1¼	January	¼	Nov. & Dec.	¼	J'n., Ap., J'e., July, & Aug.	1/10	May
Yellow Jacket	16¾	February	3¼	May	38	September	5	May	27¼	February	6¼	December

NOTE.—When quoted prices are joined by brackets, the capital stock of company has been increased, and figures given are the prices according to the original and the increased capitalization, thus facilitating the work of comparison.

TABLE VI.—STOREY COUNTY HOSPITAL.

Deaths and causes—1865 to 1880.

CAUSES.	YEARS.																TOTAL.
	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Accidents, R. R.													2				2
Alcoholism										3	3		5	1	2	1	15
Aneurism	1																1
Apoplexy														2			2
Asthma					1			1							2		4
Bronchitis								2	1	1					2		6
Cancer						1											1
Cassimona lingua											1						1
Chest diseases													6			7	13
Cholera morbus										1							1
Compression of the brain										1							1
Congestion of the brain									1								1
Constipation					1												1
Consumption														5	5	1	11
Cramps															1		1
Debility	1			1	1	1	2	2			1				3	2	14
Dyspepsia															2		2
Diarrhœa (chronic)									1		1						2
Dropsy	2	2	1			1								2		2	10
Dysentery		4	1			1									3	1	10
Eczema			2														2
Enteritis										1							1
Erysipelas		1															1
Fever, bilious				1	2												3
brain			1							1							2
gastric													1			1	2
intermittent					2												2
typhoid			1	1							5						7
typhus		1								2							3
miscellaneous								2	5		2		1	4	2	1	17
Fistula-in-ano											1						1
Fracture															1		1
Heart disease											3			2			5
Hydrothorax				1													1
Inflammation of the bladder							1										1
Injuries, miscellaneous		4	1	2		1					1		3	8			20
Insanity		1	1		1						1						4
Liver disease				1						1			1		3	2	8
Lung disease	1		2						7	9	10						29
Mania								1	1								2
Mania (unknown)										1							1
Mania-a-potu		2	2	1	3	2	1	9	5	2							27
Measles			1														1
Narcotism														1			1
Necrosis scalp										1							1
Old age													3	1			4
Orchitis								1									1
Paralysis	1	2	2	1	1				1					1	4	2	15
Peritonitis							1								1		2
Pleurisy					3												3
Pneumonia		4	2	5	3	4	2	8						1	6		35
Ptyolism		1															1
Rheumatism	2		1		2		3	1	1				2		2		14
Small-pox				6	19	1		1		4							31
Syphilis				1					1				2				4
Tumor			1														1
Ulceration of the bowels										1							1
Wounds (gunshot)					1			1					1		2		5
Unknown				1			1				1						3
TOTAL	8	22	19	22	40	12	11	29	24	29	30	—	27	28	41	20	362

TABLE VII.—STOREY COUNTY HOSPITAL—*Classification of diseases treated.*

DISEASES.	1865*	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	TOTAL.
Abscesses	2	5	0	0	1	0	2	0	9	4	7	29	16	15	22	17	129
Alcoholism	2	8	9	11	10	9	12	30	29	30	47	55	67	62	59	50	490
Cancer	0	0	0	1	0	3	2	2	0	0	0	2	0	0	0	1	11
Chest and throat diseases	2	15	14	22	18	13	13	31	34	41	65	66	32	48	74	78	566
Debility	3	0	0	4	8	10	4	4	5	10	16	22	29	23	20	19	177
Dropsy	3	1	5	1	1	2	2	1	1	0	1	0	5	5	4	2	34
Dysentery and diarrhœa	0	35	6	3	0	2	1	1	5	5	5	10	4	7	5	6	95
Dyspepsia	0	1	0	0	1	0	1	0	1	0	0	0	2	8	13	1	28
Epilepsy	1	1	1	0	1	0	0	0	0	0	0	4	8	3	0	0	19
Erysipelas	2	7	2	1	4	11	2	19	12	11	8	18	8	6	9	9	129
Exostosis	0	0	0	0	0	0	0	0	0	0	0	4	3	0	0	0	7
Eye diseases	6	3	4	3	1	1	4	6	0	2	2	14	7	12	4	3	72
Fevers	11	19	19	16	30	10	23	39	21	14	81	73	30	36	51	26	499
Fractures	3	2	3	3	2	4	4	5	5	5	23	27	15	15	0	56	172
Gastritis	1	1	0	0	0	0	0	0	3	0	0	0	0	0	2	0	7
Gun and knife wounds	1	2	2	1	3	1	4	10	2	0	8	48	53	8	0	0	143
Heart disease	0	0	0	0	0	0	1	0	0	2	8	5	0	3	1	5	25
Hemorrhoids	0	0	1	3	0	1	0	2	0	2	7	5	4	0	5	1	31
Hernia	0	0	0	1	0	0	0	0	0	2	0	0	4	0	0	0	7
Hip disease	1	0	0	0	0	0	0	0	0	0	0	0	0	4	4	2	11
Injuries, miscellaneous	10	20	11	7	3	9	7	17	20	16	16	0	0	29	75	0	240
Insanity	5	9	8	5	4	3	5	5	8	2	4	7	4	5	3	4	81
Kidney diseases	0	0	1	0	0	0	3	4	4	1	4	0	15	0	14	14	60
Liver diseases	0	1	0	3	1	0	3	4	3	1	2	2	9	8	16	8	61
Nervous diseases	1	3	0	0	0	0	2	4	0	2	2	6	0	4	0	11	35
Obstetrical diseases	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	3
Paralysis	2	6	8	6	3	8	1	1	8	8	7	15	9	14	13	11	120
Parotitis	0	0	0	0	0	0	0	0	0	0	2	6	3	0	0	0	11
Poison	0	0	0	0	0	0	0	0	0	0	1	0	0	8	12	2	23
Rheumatism	11	20	14	22	11	27	17	35	33	41	64	72	62	49	66	43	587
Scrofula	0	0	0	0	0	0	0	1	0	0	3	0	0	4	10	13	31
Skin diseases	0	0	3	0	0	0	0	0	0	1	7	14	5	4	15	0	49
Small-pox	0	0	0	30	78	4	0	1	0	8	1	5	0	0	0	11	138
Synovitis	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3
Tumors	0	0	0	0	0	0	0	0	0	1	6	4	0	3	2	0	16
Unclassified	8	26	16	29	15	15	28	30	28	36	54	31	18	27	29	31	421
Venereal diseases	19	30	20	16	9	16	24	20	37	70	86	69	99	83	87	46	731
TOTAL	94	215	147	188	204	149	165	272	268	315	537	618	511	494	615	470	5,262

* For October, November, and December only.

TABLE VIII.—STOREY COUNTY HOSPITAL.

Nationality of patients treated.

YEAR.	Americans.	English and Canadians.	Germans.	Irish.	All other nationalities.	Total.
1865*	33	5	7	34	15	94
1866	56	20	16	87	36	215
1867	50	18	14	45	20	147
1868	45	31	17	53	42	188
1869	69	28	35	44	28	204
1870	47	16	10	56	20	149
1871	40	18	24	51	32	165
1872	85	34	20	101	32	272
1873	87	30	24	88	39	268
1874	95	41	31	112	36	315
1875	186	60	49	180	62	537
1876	219	90	70	201	38	618
1877	162	78	44	197	30	511
1878	158	74	31	190	41	494
1879	232	91	32	208	52	615
1880	168	63	30	157	52	470
Total	1,732	697	454	1,804	575	5,262

* For October, November, and December only.

TABLE IX.—STOREY COUNTY HOSPITAL.

Occupation of patients treated—October, 1865, to June, 1880 (both inclusive).

YEAR.	Gamblers and saloon-keepers.	Laborers.	Miners.	Professional.	Mercantile.	Salesmen, &c.	Servants.	Tradesmen and mechanics.	Laundrymen.	Prostitutes.	Various.	Total.
1865*	3	3	50	1	1	0	6	7	2	0	21	94
1866	4	6	125	2	3	0	15	17	0	0	43	215
1867	1	11	83	5	3	2	10	11	0	0	21	147
1868	1	37	57	4	2	2	22	22	2	2	37	188
1869	11	40	74	2	4	2	11	37	0	3	20	204
1870	5	39	49	3	7	0	15	13	0	3	15	149
1871	6	44	49	3	6	0	8	23	1	5	20	165
1872	7	54	81	9	2	4	31	43	4	7	30	272
1873	13	33	99	0	19	0	16	46	4	4	34	268
1874	7	36	107	0	27	0	24	60	4	9	41	315
1875	13	156	117	5	15	12	35	87	5	12	80	537
1876	12	167	151	8	19	15	59	109	3	8	67	618
1877	10	123	135	10	4	13	31	78	2	20	85	511
1878	3	89	146	17	7	12	29	91	1	13	86	494
1879	10	88	184	9	9	16	39	123	6	12	119	615
1880	3	41	84	4	1	7	14	56	4	2	54	270
Total	109	967	1,591	82	129	85	365	823	38	100	773	5,062

Sex of patients treated.

YEAR.	MALES.	FEMALES.	TOTAL.
1865*	80	14	94
1866	203	12	215
1867	144	3	147
1868	177	11	188
1869	198	6	204
1870	143	6	149
1871	149	16	165
1872	244	28	272
1873	251	17	268
1874	289	26	315
1875	484	53	537
1876	554	64	618
1877	438	73	511
1878	444	50	494
1879	557	58	615
1880	396	74	470
Total	4,751	511	5,262

* For October, November, and December only.

TABLE X.—STOREY COUNTY HOSPITAL.

Number of patients received, diseases treated for, deaths, causes of same, with number of patients discharged for the year 1880.

Diseases and number of Patients.		Death and Causes.		Number of patients discharged.
Diseases.	Number of patients.	Diseases.	Number of deaths.	
Abscesses	17	Alcoholism	1	
Alcoholism	50	Chest diseases	7	
Cancer	1	Consumption	1	
Chest and throat diseases	78	Debility	2	
Debility	19	Dropsy	2	
Dropsy	2	Dysentery	1	
Dysentery and diarrhœa	6	Fever	1	
Dyspepsia	1	Gastritis	1	
Erysipelas	9	Liver Disease	2	
Eye diseases	3	Paralysis	2	
Fevers	26			
Fractures	56			
Heart disease	5			
Hemorrhoids	1			
Hip disease	2			
Insanity	4			
Kidney disease	14			
Liver disease	8			
Nervous diseases	11			
Paralysis	11			
Poison	2			
Rheumatism	43			
Scrofula	13			
Small-pox	11			
Venereal diseases	31			
Unclassified	46			
TOTAL	470		[1] 20	385

[1] Deaths—males, 18; females, 2; total, 20.

TABLE XI.—*Storey County Coroner's Record of Deaths in 1880—Diseases.*

CAUSES.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
Abscesses							1						1
Accidents and misc. injuries							1	1	2		1	1	6
Anasarca					1								1
Apoplexy	1			1	1						1		4
Asthma			1								1		2
Bilious fever		1											1
Blood poisoning			1										1
Brain fever							1			3			4
Bronchitis	1	1	1		1	1						1	6
Cancer	1	1							1				3
Cholera infantum								6	3				9
Cholera morbus							1	2					3
Congestion of the bowels										1	1		2
Congestion of the lungs												2	2
Consumption	2	2	3		1		1	2	1	1	3	2	18
Consumption of the bowels			2										2
Convulsions	2	1	1	1	3					1			9
Cyanosis		2											2
Diabetes										1			1
Debility					1			1	1		2		5
Diarrhœa								1	3				4
Diphtheria	1												1
Dropsy				1			1		1				3
Enteritis							1						1
Erysipelas			1								1	1	3
Gastric fever			1								1		2
Gunshot wounds			1			1							2
Heart diseases	2	3	2	1		2	1	1			2		14
Hemorrhage						1				2			3
Hemorrhage of the lungs									1				1
Hemorrhoids							1						1
Inflammation of the bowels		1	1			1			1	3	2		9
Inflammation of the brain									1	1			2
Kidney disease							1						1
Malformation of the bowels					1								1
Marasmus								1					1
Meningitis					1						1	1	3
Mercurial poisoning					1								1
Mining accidents	1	1		2	1	5	4	2	9	1	1	1	28
Miscellaneous		1			2	1	1	1	1	1	2	1	11
Palsy							1						1
Paralysis	1				1					1	1	1	5
Peritonitis	1								1				2
Phthisis pulmonalis				1							1		2
Pleurisy									2		1		3
Pluro-pneumonia	1		1										2
Pneumonia	7	3	5	5	3	4				2	1	1	31
Poison	1												1
Premature birth	2			1	1		1						5
Remittent fever						1							1
Scarlet fever	1					2			1	1	1		6
Scrofula				1									1
Starvation		1											1
Still-born		1	1		1	2			1				6
Suicide	1				2	1							4
Typhoid fever	1								2			2	5
Typhoid pneumonia				1	1						2		4
Unknown	1	1	1		1	1	5	2	3	4		2	21
Whooping cough		3		1									4
Yellow jaundice	1												1
TOTAL	29	23	23	16	24	23	22	20	35	23	26	16	280

Table XII.—*Storey County Coroner's Record of Deaths in* 1880—*Nationalities classified.*

Nationality.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Americans	14	16	12	8	15	12	7	12	20	13	10	8	147
Irish......	9	1	6	4	4	3	7	3	9	4	10	4	64
English	2	1	2	1	0	5	2	0	2	3	1	0	19
Germans..............	0	0	1	2	0	0	2	3	0	0	1	1	10
Mixed	4	4	2	1	5	3	4	2	2	3	3	3	36
Not given............	0	1	0	0	0	0	0	0	2	0	1	0	4
Total....	29	23	23	16	24	23	22	20	35	23	26	16	280

Storey County Coroner's Record of Deaths in 1880—*Age and Sex classified.*

Months.	Under 5 years.		5 to 9 years.		10 to 19 years.		20 to 29 years.		30 to 39 years.		40 to 49 years.		50 to 59 years.		60 to 69 years.		70 to 79 years.		Un-known.		Males.	Females.	Total.
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.			
January	1	4	0	1	2	0	0	1	1	1	6	3	4	1	1	0	1	1	1	0	17	12	29
February	5	3	0	0	1	0	0	1	2	2	4	1	1	0	1	0	0	0	1	1	15	8	23
March..........	1	2	1	0	0	1	2	1	1	2	7	0	2	1	1	0	0	0	0	1	15	8	23
April..........	2	3	0	0	0	0	0	0	2	1	5	0	1	1	0	0	0	0	0	1	10	6	16
May...........	3	8	0	0	1	0	0	1	2	2	4	1	2	0	0	0	0	0	0	0	12	12	24
June.....	5	1	1	1	0	1	0	0	3	1	6	1	2	1	0	0	0	0	0	0	17	6	23
July	2	2	0	0	1	0	1	0	5	1	2	2	3	1	0	0	0	1	0	1	14	8	22
August.........	5	2	0	0	0	0	2	1	1	2	0	0	2	1	3	0	0	0	1	0	14	6	20
September......	4	9	0	0	1	0	5	1	5	0	5	2	1	1	0	0	0	0	1	0	22	13	35
October	7	3	0	0	0	2	0	0	4	2	2	1	1	0	1	0	0	0	0	0	15	8	23
November	2	4	0	0	0	1	1	2	4	1	1	0	5	0	1	0	1	3	0	0	15	11	26
December	4	0	0	0	1	1	0	0	4	0	3	0	2	0	1	0	0	0	0	0	15	1	16
Totals......	41	41	2	2	7	6	11	8	34	15	45	11	26	7	9	0	2	5	4	4	181	99	280
	82		4		13		19		49		56		33		9		7		8				

TABLE XIII.—*Criminal cases in courts*

	1867.*	1868.	1869.	1870.‡	1871.¶
Sex—Male	159	137	206	247	66
Female	18	13	34	37	8
Total	177	150	240	284	74
Chinese	2	2	17	15	4
COMPLAINTS.					
Accessory to assault and battery		1			
Arson			1		
Assault and battery	46	40	57	91	34
Assault with intent to kill	6	8	11	12	1
Burglary		1	5	5	
Carrying concealed weapons	15	6	3		
Conducting lotteries					
Contempt of court					
Cruelty to animals				2	
Disorderly house					
Disturbing the peace	80	30	80	82	19
Drawing deadly weapons				13	
Drunk and disorderly					
Embezzlement					
False imprisonment					
Felony					
Fighting				7	7
Forgery		4	2	2	
Fraud					
Fugitive from justice					
Gambling without license	7	12			
Grand larceny	6	14	17	7	2
Indecent exposure			1		
Keeping a saloon without a license				3	1
Kidnapping					
Liberating a prisoner					
Loitering in saloons					
Malicious mischief	2	11	9	13	2
Mayhem					
Misdemeanor			1	1	
Murder		3	3		
Obtaining money under false pretenses	4	8	4	4	3
Opium smoking					
Peddling without a license					
Petit larceny	11	12	30	31	4
Perjury				3	1
Practicing medicine without a license					
Rape					
Receiving stolen goods					
Refusing to pay taxes					
Resisting an officer					
Robbery					
Soliciting without a license					
Threatening life			16	7	
Vagrancy					
Violating city ordinances					
Violating revenue law					
Vulgar language				1	
Voting illegally					
Guilty	122	71	116	145	19
Not guilty	50	50	113	127	53
Held for trial	5	29	11	12	2
Amount of fines paid	$3,963 75	$2,712 75	$3,234 50	$3,014 00	$1,020 00

* For September, October, November, and December only.

‡ Exclusive of December.

¶ For September, October, November, and December only.

of Virginia City, 1867 *to June* 30, 1880.

1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	TOTAL.
291	289	275	413	438	418	410	482	476	4,307
53	40	43	59	55	93	84	80	66	683
344	329	318	472	493	511	494	562	542	4,990
27	23	16	24	28	42	30	46	51	327
									1
		1	2	1	4		1	1	11
100	145	111	157	173	181	169	133	125	1,692
6	18	13	9	17	18	13	15	9	156
	3	6	9	6	8	3	11	2	59
									24
				4					4
							29	20	49
			3	1		3	3	2	14
								1	1
160	85	77	128	125	134	120	137	94	1,321
1	4	9	29	14	14	11	8	14	117
	1							48	49
				3	3		7		13
					1				1
		1					1		2
1		2		12	4	5			38
					4	1		1	14
	1	6		1		1			9
								1	1
2							1	10	32
18	12	19	35	23	22	13	17	16	221
		1						2	4
2			1			4	7	2	20
		2				2	1	1	6
						1			1
								1	1
10	8	17	18	17	18	18	21	22	186
		2	1		1				4
	1	1	2		4	3	6		19
2	1	6	1	2	3	10	4	1	36
1	3	3	7	4	3	4	5	1	54
					9		11	20	40
				3		4	1		8
36	32	21	32	66	54	55	52	66	502
1			1	1	2	2	2	2	15
			3			10			13
2					1				3
		1		2	3	2		3	11
					1				1
					1				1
		1	7	5			2		15
								1	1
2	3	4	14	8	13	7	14	11	99
	12	14	13	5	5	33	72	49	203
								11	11
							1		1
								3	4
								2	2
190	160	155	203	192	174	168	186	132	2,033
140	164	148	247	284	322	314	353	305	2,760
14	5	15	22	17	15	12	23	15	197
$4,422 00	$3,651 00	$3,459 45	$5,680 48	$3,881 75	$4,075 50	$5,127 45	$3,131 75	$1,262 00	$48,236 38

Table XIV.—*Comparative Statement of Tonnage of Virginia & Truckee R. R. for the years* 1874 *to* 1879, *inclusive.*

Articles.	1874.		1875.		1876.		1877.		1878.		1879.	
	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.
Merchandise	47,108	1,303	56,562	1,262	58,559	1,432	37,510	1,884	39,975	203	45,072	1,971
Grain and feed	5,619	1,864	6,455	721	6,299	1,312	5,638	818	6,456	1,293	6,890	929
Coal (stone)	5,879	46	4,456	1,692	6,398	1,510	5,722	350	5,235	1,026	4,900	845
Lumber (in feet. See below).	84,858	1,603	117,855	1,011	116,403	1,484	63,345	1,393	58,293	1,260	47,165	1,312
Wood, in cords	181,750	800	233,083	1,000	275,962	100	287,945	1,550	261,805	250	228,609	725
Ice	1,774	130	2,210	1,700	2,261	1,400	3,770	1,330	6,415	1,125	2,961	415
Mill salt	1,350	1,780	2,271	897	2,918	943	4,223	10	4,392	986	3,573	884
Lime and plaster	704	470	1,859	1,945	1,237	1,901	223	1,865	263	550	404	1,270
Quicksilver	includ'd in mdse.		355	285	739	1,383	758	83	463	820	375	925
Hay	2,365	162	3,351	120	4,728	200	3,440	1,550	3,231	1,434	2,879	1,485
Ore	274,343	------	216,909	1,150	278,042	340	155,757	1,600	121,143	------	52,841	360
Bullion (crude)	74	5	125	598	267	810	118	668	103	1,004	90	73
Stone, brick, and sand	includ'd in mdse.		1,441	------	792	1,340	1,855	1,000	143	1,200	------	------
Gypsum	includ'd in mdse.		761	1,000	1,010	------	1,000	------	------	------	------	------
Tailings (mill)	------	------	2,956	795	------	------	------	------	------	------	------	------
Old iron (rails)	------	------	1,200	------	------	------	470	100	------	------	------	------
Borax (crude)	------	------	------	------	22	------	------	------	------	------	------	------
Totals	605,828	163	651,862	135	755,644	215	571,780	1,[illegible]01	507,922	151	395,854	1,203

Year.	Lumber shipments, in feet.	Year.	Wood shipments, in cords, including consumption by Company's locomotives.	Year.	Quicksilver shipments, in flasks.
1874	52,220,801	1874	130,808	1876	10,336
1875	72,526,465	1875	179,295	1877	16,465
1876	71,633,072	1876	212,278¼	1878	10,298
1877	38,981,967	1877	221,496¾	1879	7,796
1878	34,427,502	1878	205,311½		
1879	31,443,771	1879	165,622¼		

Note.—Free freight (Company's supplies) included in the above.

D. A. BENDER,
General Freight Agent.

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